Model of Parent Engagement in Academic Support:

Focus on Students with Disabilities

By

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Abstract

This qualitative study investigated online strategies for involving parents in supporting the academic development of their children. The parental support component of the Blending Assessment with Instruction Program (BAIP) was employed as the model for researching parental involvement. BAIP integrates assessment standards in mathematics with instructional resources for teachers, students and parents. The BAIP parental support for Mathematics uses online support and teacher interaction to inform parents of the concepts their students are learning in the classroom while the instruction is occurring. It also provides suggestions on how parents may engage their children in understanding the concepts through relevant structured activities, teachable moments, and other at-home pedagogical strategies.

The perceptions and experiences of parents, students, and teachers engaged in the BAIP were examined in this study. In-depth interviews and observations were conducted on a purposeful sample in a private school for students with learning disabilities. Participants included three teachers, their students who were functioning at or enrolled in middle school grades, and the students' parents. Each parent had experienced providing a variety of supports for their student who had a history of learning problems. Three key themes emerged during the analysis of the qualitative data: *A) Parents and teachers perceived parental involvement differently.* Based on prior experience in public schools, the parents did not believe that their support was highly valued by previous teachers. Teachers in parents' past experiences did not value parent involvement in academic teaching of the concepts, but valued the parents' role in supportive activities such as telling their child when and what they should study. *B) Parents and teachers have different expectations and requirements of parent resources.* Teachers in the study expected parent resources to focus on informing parents what the child is studying in school,

whereas parents expected the resources to be teaching aids. Teachers expected parents to use the resources on a voluntary basis but parents actually preferred it to be a requirement. Both teachers and parents thought the BAIP parent resources could replace traditional homework and parents thought it could provide opportunities to bond with their child. Teachers underestimated parents' ability to teach and understanding of informal teachable moments whereas parents proved to be familiar with using teaching moments. Two of the three teachers thought the BAIP model was somewhat rigid whereas parents appreciated the structure and guidance. *C) BAIP is a functional parent engagement model.* Using Epstein's six types of parent involvement and Hoover-Dempsey and Sandler's motivations for parent involvement, the researcher found that BAIP increased parent motivation through empowerment and access to resources that was consistent between home and school.

Results suggest that the BAIP's parental support component provides a framework for an emerging partnership model that involves parents and schools in making decisions together, clarifying roles and expectations and maintaining effective ongoing communication between schools and homes to enhance student learning. Future research could explore the long term effects on student achievement after experiencing academic support that is consistent across home and school. Studies on effectiveness and maintenance of parent involvement programs as well as expanding the literature on teachable moments could impact the support that students receive.

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Chapter 1: Statement of the Problem

Overview

Mandating curriculum standards is currently a major educational reform in the United States (U.S). Underlying this movement are the assumptions that curriculum standards contribute to educators having clearer and stronger performance expectations, and that students respond to these expectations by demonstrating higher levels of achievement. These assumptions were evident in 2000 when the National Council of Teachers of Mathematics (NCTM) set the Principles and Standards for School Mathematics (Battista et al., 2007; Jacobs et al., 2006). Likewise, in 2006 these assumptions were further considered in the standards known as Curriculum Focal Points (Clements & Sarama, 2008). Shortly after, the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b) were established. Development of the Common Core State Standards was a collaborative effort led by the Council of Chief State School Officers (CCSSO) and the National Governors Association (NGA) to provide direction for instructional reform (Gewertz, 2010). The goal of the Common Core State Standards is to better prepare students to be college- and career-ready (Mathis, 2010).

In the larger context of ensuring educational equity for all learners, a change in public policy that greatly affected the education of students with disabilities (SWD) was the passage of the Education of All Handicapped Children Act, Public Law 94-142. This was reauthorized as the Individuals with Disabilities Education Act, Public Law 108-446, in 1997 and subsequently reauthorized as the Individuals with Disabilities Improvement Act (IDEIA, 2004) to assure a free appropriate public education (FAPE) to all SWD. The Elementary and Secondary Education Act (ESEA) of 1965 preceded No Child Left Behind (NCLB, 2001), Public Law 107-110 (NCLB,

2001; Yell, Katsiyannas, & Shiner, 2006); and Title I stated in NCLB act of 2001 pertains to improving the academic achievement of the disadvantaged. Disadvantaged students are defined as low-achievers, poverty-stricken, limited English proficient students, migratory children, Indian children, neglected or delinquent children, young children in need of reading assistance, and SWD (U.S. Department of Education, 2014). NCLB (2001) is results oriented, requiring states to be accountable to the federal government for student performance, with sanctions for lack of progress. Since NCLB (2001), schools are required to test all students in several key skill and content domains, including Mathematics. Schools report achievement results and adequate yearly progress (AYP) data of all students and of four subgroups, one of which is SWD. For a state to meet AYP objectives at least 95% of all enrolled students and 95% of each subgroup must participate in the statewide testing; and target proportions of all students and each subgroup are rated proficient. States are expected to decrease by 10% a year the proportion of students in any subgroup that did not meet the state's proficiency target in the previous year. Finally, states are expected to improve graduation and attendance rates across all students. Each state establishes its own assessment procedures, proficiency goals, and benchmarks for measurement of student progress.

The standards movement is considered by many as evidence of educational progress in which curriculum is no longer "a mile wide and an inch deep" (Mathis, 2010). Much research went into internationally benchmarking the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010c). However, what has not been researched are the dynamics in learning environments where teachers strive to implement curriculum based on these prescribed standards. A challenge for teachers is that considerable content knowledge and time are needed to translate standards into

instruction (Thurlow & Wiley, 2004). This challenge is especially true in the development of lesson plans for teaching mathematics to struggling learners and students with learning disabilities (Meyen & Greer, 2009). Gewertz (2010) found that the language used in the standards can complicate the process of translating them into instructional plans. Standards often lack the specificity needed as guidance for lesson planning.

The challenges posed by the standards can be even more daunting for parents who attempt to assist their children in learning the standards-based content provided by their teachers. I hypothesize that standards-based reform efforts paid insufficient attention to the role of parents in the context of how to provide complementary academic support for their children. Publicly available data reporting systems are mandated at state and federal levels to inform parents and others about the performance of the schools their children attended. Although this practice provides a monitoring mechanism, it contributes little to understanding the process teachers follow in translating standards into instruction, individualizing instruction, and/or engaging parents in the overall educational process. These circumstances may be further complicated by the demands placed on teachers to ensure adherence to curriculum standards and the public disclosure of how local schools fulfill the expectations of curriculum standards (Mathis, 2010). The value of reporting student assessment data by school, district, and state is in meeting the needs of policy makers, but not necessarily the needs of parents. However, without an investment in qualitative research to inform the instructional process, principals, teachers, and parents are disadvantaged in maximizing learner outcomes in a standards-based learning environment. Standards can be mandated, but they are not sufficient to create effective learning environments.

Standards currently vary from state to state, consequently alignment to the Common Core State Standards represents considerable changes for most schools (Porter, McMaken, Hwang, & Yang, 2011). Publishers of educational resources have added to the implementation of curriculum standards by making the alignment of their products with standards a hallmark of their marketing efforts. An outcome of this movement that merits research is the ramifications that curriculum standards and assessment-based accountability have on the role of parents in supporting the learning of their children. Thus, in this study the term "curriculum alignment" will refer to consistency in instruction at home and in school, i.e., the relationship of the content and skills teachers teach in their classrooms, homework assignments, and related experiences to the guidance they provide parents for assisting their children in meeting curriculum standards.

Prior to the Common Core State Standards, most states voluntarily based their state mathematics frameworks and benchmarks on the NCTM standards, the most current of which was Principles and Standards for School Mathematics released in 2000 (National Council of Teachers of Mathematics, 2014). Previous volumes of standards releases included the Curriculum and Evaluation Standards for School Mathematics in 1989, Professional Standards for Teaching Mathematics in 1991, and Assessment Standards for School Mathematics in 1995. Parents who completed their K-12 education between 1989 and 2014 will have experienced a math education based on evolving standards. With a new set of Common Core State Standards, they may find themselves in situations in which they are unfamiliar with the teaching methodologies employed by the teachers of their children when providing mathematics instruction (Lange & Meaney, 2011). They may not even understand the math vocabulary critical to learning contemporary mathematics. Yet, parents are motivated to be helpful to their children by reinforcing the instruction their teachers provide and by offering their children

opportunities to apply what they are learning in real life situations (Ginsburg, Duch, Ertle, & Noble, 2012).

Under the law, all students must participate in statewide testing and school districts are required to provide SWD access to appropriate accommodations when participating in these assessments (Salend, 2008). Many SWD struggle with learning mathematics at grade level and require accommodations or alternative content at lower grade levels, which is challenging since NCLB (2001) and IDEIA (2004) require SWD be held to the same standards as their peers without disabilities (Yell, Shiner, & Katsiyannas, 2006). When grade-level achievement standards are not useful for assessing the performance of SWD (Yell, Shiner, et al., 2006), federal regulations permit states to use alternative content standards for students with significant cognitive disabilities, or modified achievement standards for students with mild learning disabilities. If the standardized state assessment with accommodations is not appropriate, an alternative assessment should be provided. Yell et al. (2006) stated that the need for an alternative assessment is determined by the student's Individualized Education Program (IEP) team. Yell et al. (2006) also noted that not all SWD receive appropriate alternative content since only a small percentage of one or two percent of grade-level students receiving alternate assessments can be counted towards AYP. In addition, the US Department of Education is reported to be moving away from the use of modified achievement standards and many states that offer this alternative may phase it out shortly (National Center on Educational Outcomes, 2013).

Although SWD are required by IDEIA (2004) to have an IEP, the IEP often falls short in providing parents with sufficient guidance on how they can effectively assist their child in fulfilling the objectives of the IEP to meet curriculum expectations (Fish, 2008; Reiman, Beck,

Coppola, & Engiles, 2010). Fish found that during IEP meetings, parents often felt that educators did not treat them equally and their "input was not valued or welcomed by most educators" (Fish, 2008, p. 66). Parents wanted to be equal contributors treated with respect, viewed as being educated in special education law, and committed to seeing that IEP objectives are properly implemented and adhered to. However, Childre and Chambers (2005) found that in reality families felt they played small roles in traditional IEP meetings, usually limited to listening to information presented by professionals about their children's education. When schools set goals and objectives prior to the parent's participation in the IEP meeting, parents get the impression that "meetings are merely a legal obligation of schools" (p. 224), and teachers at the meeting do not expect parents to be active contributors. Productive planning and implementation of IEPs happen, and children's interests are best served when a culture of strong family-educator partnerships permeate IEP meetings (Reiman et al., 2010).

Parental involvement has been found to play a significant role for typically developing elementary students (Rogers, Wiener, Marton, & Tannock, 2009). Positive effects are seen in increasing student achievement, improving academic motivation, and decreasing behavioral issues (Civil, Bernier, & Quintos, 2003; Epstein, 1987; Sheldon & Epstein, 2005). Parental involvement "has a significant positive impact on children across race and across academic outcomes" (Jeynes, 2003, p. 213). Research also supports the benefit of parental help with homework (U.S. Department of Education, 2005; Walker, Hoover-Dempsey, Whetsel, & Green, 2004) and in assisting their children in meeting the expectations of the standards-based curriculum (Civil et al., 2003, p. 6). Gordon and Hickman (1991) reported that researchers like Rhine (1981), Williams and Chavkin (1989), Cervone and O'Leary (Cervone & O'Leary, 1982), and Hester (1989) proposed the involvement of parents as co-educators, home tutor, and teachers

among many other roles. Such other roles may include parent volunteers, paraprofessionals, advocate, educational decision makers, and supporters of activities. Relatively little research that focus specifically on supporting home instruction is reported in the literature (Chen, Yu, & Chang, 2007).

Although the literature is generally favorable toward parents supporting their children in meeting educational expectations in school, variations are reported in the nature of instructional support (Huntsinger & Jose, 2009) and the attributes of students in greatest need of parent support (Ginsburg et al., 2012). Gordon and Hickman (1991) asserted that "the most effective educational program would be one in which the home and school work together on behalf of the child" (p. 10). In particular, struggling learners and SWD often do not possess the necessary prior knowledge and skills to do the work assigned to them. Title I of NCLB (2001) Section 1118 requires that every school district and school receiving Title I funding must have a written PI policy that can be effectively implemented (National Coalition for Parent Involvement in Education, 2004). However, no enforcement provisions are in place so parents need to take the lead on schools carrying out their PI policies. Recent research shows that parents of SWD want to be more effective in providing instructional support, but they lack the necessary strategies to be effective participants in instruction (Ginsburg et al., 2012; Hampshire, Butera, & Bellini, 2011). This proposition is especially true in science, technology, engineering, and mathematics (STEM) fields, and for children who are in danger of experiencing emotional and mathematical trauma when struggling with homework (Lange & Meaney, 2011).

Programs have emerged in the last decade to address the needs of parents in assisting their children. Staples and Diliberto (2010) suggested that teachers create monthly toolkits for parents. Each toolkit might include strategies, activities, and tips that parents can engage in with

their children at home. Strategies may be behavior management activities, playing academic games, reading aloud, and so on. Tips might include recommendations on setting homework routines, supporting healthy living, and embedding structure in the home environment. These authors stressed that the toolkits should reflect topics and themes addressed in the classroom during a specific month. Many online tool kits have been created for parents providing growth charts, tips and guides, benchmarks for each grade, and links to related resources. Examples of parent online toolkits include the NBC News Education Nation (http://www.parenttoolkit.com), EngageNY toolkit (http://www.engageny.org/parent-and-family-resources), and the Northwest Evaluation Association (http://www.nwea.org/node/4661).

Several school-based programs engage parents in instruction. For example, Woodridge Primary School in Ohio holds math nights where families learn about the state's math standards, experience teacher-led math sessions on ways to help their children learn math at home, and receive bags of math resources, which include the state standards (Epstein & Salinas, 2004). The INSPIRE program involves one class per school and each student brings an adult to school to work collaboratively with the teacher on activities consistent with the math curriculum (Bateson, Wolfendale, & Bastiani, 2000; Desforges & Abouchaar, 2003). The Teachers Involve Parents in Schoolwork (TIPS) program requires students to demonstrate mastery of new mathematics skills for parents and then discuss the use of mathematics in daily life (Patall, Cooper, & Robinson, 2008; Sheldon & Epstein, 2005; Walker et al., 2004). The Partners in Education (PIE) program involves parents as equal active partners in five ways: (a) make decisions in the form of goals between parents, teachers, and students; (b) support parents with research that helps them help their children learn; (c) appreciate the fact that parents are teachers as well; (d) model good

learning practices and value of education; and (e) promote regular two-way communication via multiple mediums (McReynolds, 2004).

The Blending Assessment with Instruction Program (BAIP), developed by the eLearning Design Lab (eDL) at the University of Kansas, was designed to provide teachers access to standards-based mathematics lessons and independent study online tutorials for students (Meyen & Greer, 2009; Meyen, Greer, & Poggio, 2009). The motivation to develop the BAIP emerged in the context of the tasks faced by teachers in translating state standards into instructional plans for classroom application. The BAIP was developed prior to the advent of the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b). The development of the BAIP was a collaborative project with input from more than a hundred practicing math educators over a five-year period. The program was designed as a supplemental curriculum in mathematics for Grades 3 through 10. The BAIP initially was comprised of 280 lessons and 310 online independent study tutorials for students. The content of the lessons and tutorials were aligned with Kansas and NCTM standards. A glossary of 740 mathematic terms across NCTM standards was also included in the BAIP (Meyen & Greer, 2009). With the emergence of the Common Core State Standards, the eDL added lessons and tutorials, totaling more than 350 lessons and 405 tutorials. As a result of field testing the original lessons and tutorials, teachers reported the need for a parent resource to enhance instructional support at home in a format consistent with instruction occurring in the classroom (Meyen & Greer, 2011). Support for the development of such resources is especially important for meeting the needs of struggling learners and SWD. Therefore, the eDL developed the BAIP parent resource in 2008 and 2009 and made them available for pilot testing in 2010.

The BAIP parent resource provides opportunities for real-life experiences in non-school settings that are consistent with standards-based classroom instruction. The parent resource includes: (a) formal and informal activities consistent with the concepts and skills taught by the teacher through the standards-based lessons and the online student tutorials, (b) tip sheets on how to support students at home, and (c) an animated dictionary of math terms. The eDL annually collects teacher usage data in the form of clicks for these parent resources, but previously did not collect data that described *how* teachers, parents, and students interacted in the process of implementing the parent resource (Meyen & Greer, 2010b).

Statement of Problem

In recent years state and national public policies to improve learner outcomes have emphasized curriculum standards and assessments of student performance. However, the alignment of these standards with common *instructional practices* remains a work in progress. Research on the alignment of previous state curriculum standards with Common Core State Standards anticipates considerable change in schools (Porter et al., 2011)**.** However, paucity exists in the research literature regarding the perceptions and experiences of parents, students, and teachers in their respective roles when they are engaged in instruction that is consistent with classroom instruction and curriculum standards. This lack of studies is especially significant for parents of SWD who are concerned about their children having an opportunity to meet the newly framed curriculum standards. Much of the research that has been done on parent involvement (PI) utilized survey research methods, which tends not to provide the depth of information needed to better understand school-family partnerships (Halsey, 2012). For instance, Guskey, Ellender, and Wang (2006) evaluated a community wide parent/family involvement program, but

due to confidentiality restrictions, data collected from the triad (i.e., responses from teachers, parents, and students) could not be matched. They therefore used pooled, within-school scores in their quantitative analysis. The mismatch may have caused dramatic differences in reported levels of involvement, which the researchers attributed to the difference in response rate per group. They surmised that it may very well be due to the "true disparities in the perceptions of involvement among teachers, parents, and students" (Guskey et al., 2006, p. 23). Follow-up research employing qualitative methods has not been identified in the literature.

With the implementation of the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b), two state-led consortia, Partnership for Assessment of Readiness for College and Careers (PARCC) and the Smarter Balanced Assessment Consortium (Smarter Balanced) are expected to develop assessments by the 2014-2015 school year. Two additional consortia, working through the National Center and State Collaborative Partnership and the Dynamic Learning Maps Alternative Assessment System Corsortium, will develop a new generation of assessments for students with the significant cognitive disabilities. However, curriculum will be developed by teachers, states, or publishers of instructional material. An argument can be made for the importance of conducting qualitative research that expands understanding of (a) how parents engage in reinforcing standards-based instruction offered by teachers, and (b) provide instructional support for students during non-school time. This research study addressed that need through qualitative research methods that investigate the implementation of the BAIP mathematics parent resource in a private school that serves students with learning disabilities. As data were analyzed, a partnership between parents and teachers emerged and Swap's (1993) theory of home-school partnership was added to inform the analysis of the BAIP.

Theoretical Frameworks

To overcome the limitations of prior research, qualitative methodology using semi-structured interviews comprised of open-ended questions was employed to investigate the perceptions of parents, students, and teachers regarding implementation of the parent component of the BAIP. The research design was informed by Epstein's six types of involvement (Epstein, 1995; Epstein & Salinas, 2004) with a focus on learning at home. Since PI is instrumental to supporting learning at home, Hoover-Dempsey and Sandler's motivations for PI framework (Hoover-Dempsey et al., 2005) was referenced as a guide for implementing the BAIP. Swap's home-school partnership framework was referenced after it became apparent that PI at the private school could benefit from more structure. The framework helped to establish a broader model of parent engagement.

Epstein's Six Types of Parent Involvement.

Epstein's framework defines six types of PI that broadly included the most common definitions of PI in the literature (Ji & Koblinsky, 2009). The six types may be sorted into home-based and school-based involvement. Home-based types of involvement include (a) parenting, (b) *learning at home*, and (c) home-school communication. School-based types of involvement include (d) volunteering, (e) community involvement, and (f) decision making. These six types of PI were incorporated in Swap's home-school partnership framework.

Hoover-Dempsey and Sandler's Motivations for Parent Involvement.

The creators of the BAIP did not reference Hoover-Dempsey and Sandler's framework when creating BAIP but it appeared to be consistent with the framework (Meyen & Greer, 2010b). The BAIP is responsive to family contexts, supportive of parental self-efficacy and role construction, and have built-in invitations to parents in the form of access to resources consistent

with the standards based classroom instruction provided by their children's teachers. Hoover-Dempsey and Sandler's framework was referenced in the study as an evaluative framework for how functional the BAIP is as a parent engagement model.

Level one of the Hoover-Dempsey and Sandler's framework (*Figure 1*) includes three constructs, the first of which focuses on parents' personal motivators for involvement and include role construction for involvement and parental efficacy for helping students succeed. The second construct is parents' perception of school, teacher, or student invitations to be involved. The third construct relates to family life contexts and includes parental knowledge and skills, parental time and energy, and family culture.

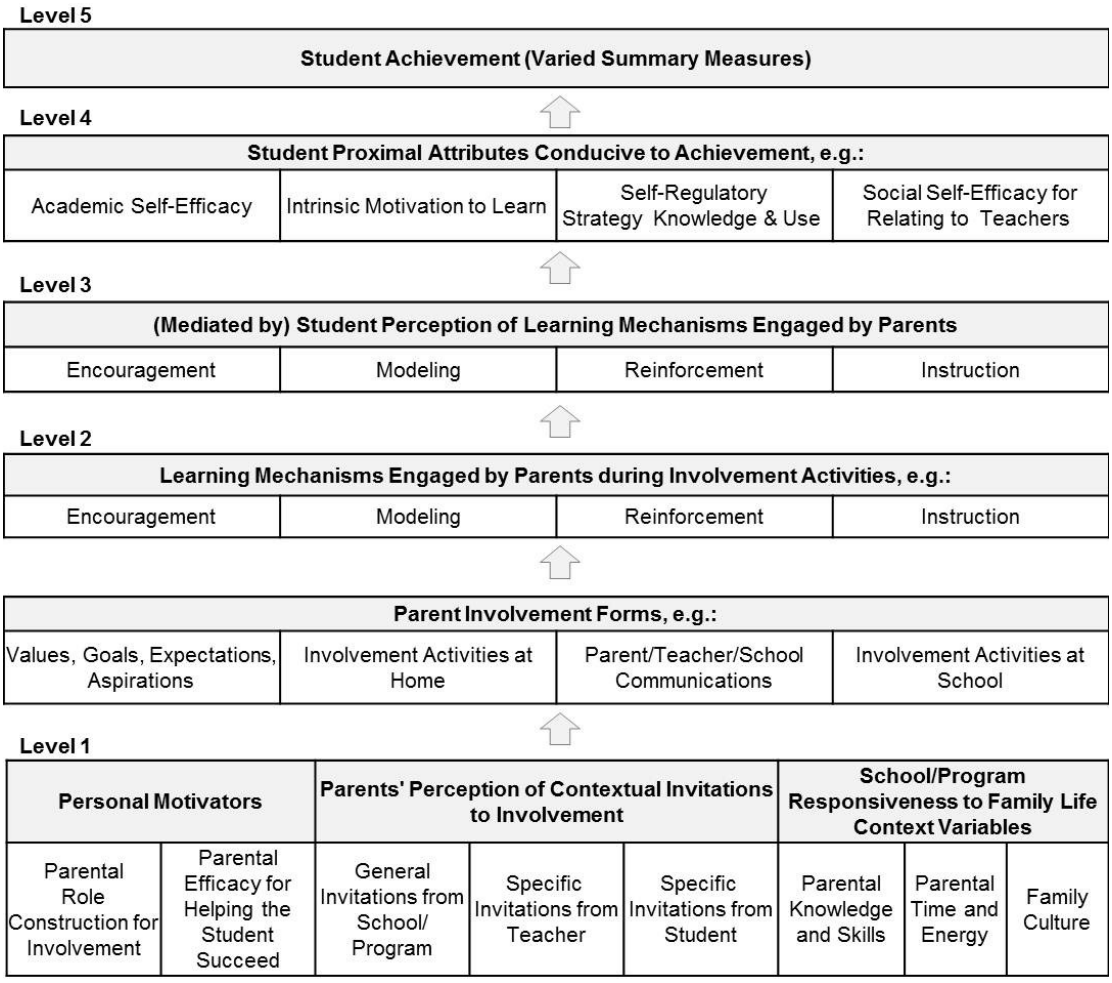

***Figure 1*:** Hoover-Dempsey and Sandler Framework

Level two of the Hoover-Dempsey and Sandler's framework included forms of parent involvement and learning mechanisms engaged by parents during involvement activities. Forms of parent involvement included (a) values, goals, expectations, and aspirations; (b) involvement activities at home; (c) home-school communications; and (d) involvement activities at school. Learning mechanisms engaged by parents include encouragement, modeling, reinforcement, and instruction.

Beyond the scope of this study were levels three through five of the Hoover-Dempsey and Sandler framework. Level three of the Hoover-Dempsey and Sandler framework is student perception of learning mechanisms engaged by parents. Level four is about student proximal attributes conducive to achievement, such as (a) academic self-efficacy, (b) intrinsic motivation to learn, (c) self-regulatory strategy knowledge and use, and (d) social self-efficacy for relating to teachers. Level five of the Hoover-Dempsey and Sandler framework relates to student achievement.

Swap's (1993) Home-School Partnership Framework.

Swap's home-school partnership framework has four elements, (a) creating two-way communication between parents and educators; and (b) enhancing learning at home and at school through having high expectations, providing conducive learning environments, emotional support, modeling and enforcing discipline, providing guidance and encouragement. Parents and educators work collaboratively to develop ways in which parents can be involved within and outside the classroom. Parents "understand what is occurring in the curriculum and ways in which they can monitor, assist, or extend children's homework." The third element is (c) providing mutual support between educators and parents through the provision of school-

initiated educational programs for parents and parental volunteering in school. The last element is (d) making joint decisions to improve the school by participating in council, committee, and planning and management teams. These components establish a broader model of parent engagement.

This study explored how participants in the form of triads, comprised of parents, students, and teachers, engaged in the use of the BAIP online parent resource in mathematics. The BAIP uses an invitation process initiated by a teacher to parents of students in his/her class. The invitation was to engage with their children by using the parent resources. Parents who accepted this invitation become BAIP users with access to its parent website. The website is designed to share resources and to enhance communication between parents and teachers. The parent resource is consistent with the teacher resource, which in turn is consistent with curriculum standards.

This research investigated the experience and perceptions of teachers, students in the teacher's class and a parent of the student throughout a teaching and learning process (*Figure 2*). The process involved (a) a teacher providing instruction using a BAIP lesson, (b) a teacher sharing the complementary BAIP parent activities with the student's parent, and (c) the parent engaging his or her child with the resources. Because the BAIP parent resource has only been available for a short period of time, this study is an original contribution to understanding how actual users experience and engage in the implementation of the BAIP parent resource in one school.

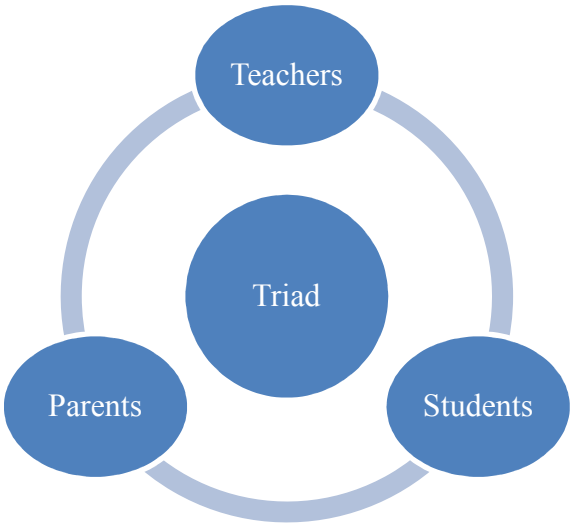

Figure 2. **Triad – Parent, Student and Teacher**

The specific qualitative methods used in this research include semi-structured interview questions and observations. The inherent demands of these qualitative research methods require that the participating school understand its role in the research and agree to many accommodations for typical BAIP parent resource utilization. The study procedures and the level of involvement of teachers, parents, and students are evident in the school selection criteria. The following five criteria guided the selection of the participating school.

1. The school has no prior experience in using the BAIP in teaching mathematics.
2. The school administration is supportive in facilitating the engagement of parents as participants in the study.
3. The enrollment of the school includes a sufficient number of students with IEPs for learning disabilities to ensure access to students with learning disabilities and their parents.

4. The administration suggests or provides private and appropriate space for conducting interviews of students and parents if conducting such activities in the home was inconvenient for the parents.
5. The administration permits participating teachers to engage in teaching the BAIP lessons and to participate in training on how to use the BAIP lessons in teaching mathematics. This permission included the teaching of content from the BAIP and allowing teachers to participate in training sessions outside of class time that the school may deem as professional development workshops.

One private school met all five criteria. The selected school is a small private school enrolling only students with learning disabilities from elementary through high school. The faculty held weekly meetings to talk about student progress and educational plans. At the time of the study, enrollment at the school did not exceed 70 students, and each classroom had no more than nine students; therefore, each teacher was familiar with most students in the school. All students enrolled in the school during this study were reported on the website as having average intelligence or above. Students generally enroll in this school because, after researching options, parents perceived the school as having a strong potential for meeting the needs of their children. As a private school, tuition is the primary source of revenue, which translates to high expectations on the part of parents relative to improving learner outcomes and a vested interest in the quality of instruction to be experienced by their children.

Guiding Research Questions

This research study examined the experiences and perceptions of teachers, parents, and students in the process of engaging parents with their students in an instructional support role

outside of the school. Research questions were stated as guiding research questions based on the assumption that the study would likely produce emergent questions that were not initially anticipated but meriting careful exploration. The following guiding questions were stated as a strategy for constructing a loosely defined frame of reference for entering the world of the triad members as they began the process of teachers engaging parents in an academic support role. The reality of their real-world instructional environment involved teachers inviting parents to engage their children in activities that were directly related to the classroom instruction provided by the children's teacher.

1. How do teachers, parents, and students experience their respective roles in the implementation of the BAIP model?
2. How do teachers and parents perceive the value of the BAIP instructional model in assisting their students/children in mathematics instruction in school and in non-school settings?
3. How do students perceive the value of parents providing mathematics instruction at home and what is their perception of its value?
4. How does the alignment of resources with standards and classroom instruction affect parent perceptions and use of the resource?
5. How do parents' perceptions of their math competency change as a result of engaging with their children in implementing the BAIP parent resource in mathematics?
6. How do parents, teachers, and students believe the BAIP process relative to the BAIP parent resource can be improved?

As the interview process unfolded, themes became evident and took on meaning that enhanced the process of describing what was learned. Chapter 4 will report results by themes instead of the guiding research questions.

Definitions

Blending Assessment with Instruction (BAIP) Teacher Resources: BAIP is a website for teachers with three key components and a management system. Components include (a) teacher lessons, (b) tutorials, and (c) parent activities. Each lesson consists of five frameworks, contextual, teaching, lesson, application, and extension that are scripted. Lessons have accompanying student tutorials that teachers can assign. Teachers also have access to parent activities that can be shared with their students' parents.

BAIP Parent Resources: A website for parents with three components. The components include (a) lessons that complement teacher instruction, (b) tip sheets, and (c) an animated dictionary. Each lesson consists of notes to the parent, coverage of math standards, lesson vocabulary, scripted dialog in Structured Activities, and suggestions for Teachable Moments.

Case Study: A process or detailed record of research on a group or situation.

Common Core: The Common Core State Standards Initiative is a collaborative effort led by the CCSSO and the NGA. It established a single set of clear educational standards for kindergarten through 12th grade in English language arts and mathematics that states voluntarily adopt. The standards are designed to ensure that students graduating from high school are prepared to enter credit bearing, entry-level courses in two or four year college programs or enter the workforce. The standards are clear and concise to ensure that parents, teachers, and students have a clear understanding of the expectations in reading, writing, speaking and listening to language, and in

mathematics in school (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b).

Curriculum Alignment: Curriculum alignment in this study is used to indicate the consistency of school and home instruction, i.e., relationship of the content and skills teachers teach in their classrooms with the homework and related experiences they assign students, and the guidance they provide parents in assisting their children in meeting curriculum standards. All three components of lessons, homework, and parent resource are consistent with curriculum standards.

Curriculum Standards: Standards are descriptive statements that provide clarity and consistency in what is expected of student learning.

Functioning Level: Performance level in a topic that is dictated by knowledge and not age.

Grade Level: Year or class that students are currently enrolled. Students at the private school are placed in classes by chronological age, but each class has a diverse range in student performance level.

Home-School Responsibility: This refers to what one party, such as the school or home, expects of the other in terms of taking responsibility for student learning.

IDEIA (2004): Individuals with Disabilities Education Act of 1997 reauthorized as the Individuals with Disabilities Improvement Act in 2004. This is a federal special education law ensuring that educational needs of SWD are met in public schools by providing free and appropriate education (FAPE).

IEP: Individualized Education Program, which is a plan for a child with special education needs in a public school, and is required as a guide to delivery of support and services.

NCLB: NCLB (2001) §1118, reauthorized in 2001, is an extension of the Elementary and Secondary Education Act of 1965 (ESEA). NCLB (2001) puts in place standards and

accountability requirements that regulate federal spending on K-12 programs. The goal is to improve educational equality and access via increased educational opportunities for children from lower income families.

Parent-Child Home Session: Parent and child engage in informal math activities, BAIP Teachable Moments, at home prior to the school session.

Parent-Child School Session: Parent and child engage in formal math activities, BAIP Structured Activities, in school. School sessions include an observation of the parent-child interaction, as well as pre- and post-interviews of the parent and a post-interview with the student.

Qualitative Methods: A method of inquiry that answers why and how questions. Examples of qualitative methods include basic interpretive, grounded theory, phenomenology, and ethnography (Merriam, 2009).

Struggling Learner: A student who demonstrates difficulty in academically keeping up with peers of the same age or grade level.

SWD: Students with disabilities

Limitations

The study was conducted in a single private school in the Midwest that served only students identified as having a learning disability and thus not representative of all schools. However, there are other private schools that serve students with learning disabilities. Students learned in small classrooms that tailored instruction to each student's personal IEP, a context that is vastly different from a typical public school where SWD are integrated into classrooms with non-disabled peers and where a general education curriculum is implemented. Students' parents were all highly involved parents, which may not be true in all schools. Participants were selected

based on a set of criteria. The final selection included parents, teachers, and students who met the criteria and voluntarily decided to participate in the study.

The intervention included (a) a BAIP lesson selected by the teacher as being appropriate for the participating student, (b) online student tutorials related to the lesson, (c) access by parents to the parent resource specific to the lesson, and (d) other parent resource in the form of an online dictionary and tips on working with their children. All participants were first time users of BAIP. The results may have differed had the participants been experienced users of the BAIP, engaged in a different set of lessons, and/or the intervention had been extended to cover several lessons over a longer period of time. Findings may have differed as well if the observation was conducted in participants' homes instead of at school. Students receive instruction in school and were therefore comfortable with the setting. However, students may not have been as familiar with receiving instruction from their parents in school instead of at home. Parents usually provide support at home and it was not as natural to teach their children mathematics in the school. However, parents visited the school often for school-related events and are familiar, and therefore comfortable with the place.

Participants in this study were SWD but may share similarities with other students without diagnosed disabilities or with struggling learners. Participants were of average intelligence or above and have had public school experience. Their parents utilized strategies that parents of non-SWD would also consider. All parents who completed their K-12 education between 1989 and 2014 will have experienced a math education that is different from their children. These limitations affect transferability of the findings but thick description is provided to allow those who can relate to this context to use the results.

Summary

The implementation of standards-based curricula in U.S. schools is changing the instructional environment for all learners. Parents as well as teachers have much to learn about how best to coordinate the engagement of parents in providing support for their children that is consistent with classroom instruction based on curriculum standards. Such alignment is a particular challenge in the context of ensuring an appropriate education for SWD. This research examined the experiences among teachers, parents and students when implementing a model in which the classroom instruction and resources aligned with a curriculum standard were made available to parents as aids to providing academic support for their children.

Researcher Background

The parent resource intervention is an integral part of the Blending Assessment and Instruction Program (BAIP) developed at the University of Kansas. Having worked as a Graduate Research Assistant on this program for five years, of which two were spent working on the parent resource, I was familiar with the design and development of the parent resources. This experience stimulated a special interest in learning how the parent resource was used and how teachers, parents and students perceived the experience of participating in use of the BAIP parent resource.

With my personal involvement in the development of the BAIP, I have preconceived notions of how the resource is and should be used. I sought to be impartial throughout the study, not pushing participants to use the BAIP in any way other than how they would naturally choose to use it. For example, when parents asked if I had instructions for them on how to use the resource, I would suggest they do what was comfortable for them. I used prepared interview

questions as a guide but did not restrict participants from sharing more information. Detailed anecdotes and descriptions were captured on audio and video to provide rich description. Each participant's interview was transcribed verbatim with added descriptions of on-verbal language, and then sent for member checks. When analyzing the data, I utilized open coding before attempting to create categories and themes to answer research and emergent questions. Therefore, the topics of the study were based on interview content, rather than on personal biases. I remained an objective observer and interviewer in eliciting perceptions and accounts of experiences from participants. Although I had prior perceptions of the study questions, I was open to diverse and opposing perceptions offered by participants.

Chapter 2: Literature Review

The development of subject-specific curriculum standards, e.g., National Council of Teachers of Mathematics (NCTM), combined with the recent introduction of Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b), has resulted in an increased emphasis on parent involvement in providing academic support for their children (U.S. Department of Education, 2010, p. 5). This is especially true for mathematics and particularly for struggling learners and SWD. Parent involvement was clarified by passage of national policy-setting legislation, NCLB (2001), which extended the application of standards to all students, including those with disabilities. Reauthorization of the IDEIA (2004) further reinforced parent involvement as an essential factor in improving student outcomes for SWD (Family Empowerment and Disability Council, 2012). These policies added to the need for PI models and instructional resources to enhance parents' expanded academic support role. For the most part, the focus shifted to parent engagement in nonschool settings (Ascher, 1988) with a focus on the same support skills and concepts being taught at their children's school (Townsend, 2010).

Focus on SWD and Mathematics.

According to the National Mathematics Advisory panel (2008), an understanding of fractions, including decimals, percent, and negative fractions, is necessary to succeed in algebra. For many American students, this proficiency is severely underdeveloped. Whole numbers, fractions, and certain aspects of geometry and measurement form the critical foundations of algebra. The report states that difficulty with fractions is pervasive, and teachers reported that students taking Algebra I were poor in "rational numbers and operations involving fractions and decimals" (p. 23). As an example of the severity of the problem, the report cited the recent

National Assessment of Educational Progress (NAEP, "The Nation's Report Card") as reporting that "27% of eighth-graders could not correctly shade 1/3 of a rectangle and 45% could not solve a word problem that required dividing fractions" (p. 3).

Research across countries has found that quantity and quality of math practice, its emphasis within the curriculum, and PI in mathematics learning impact student performance (NMAP, 2008). The report further notes that American students lack sufficient practice to ensure "fast and efficient solving of basic fact combinations and execution of the standard algorithms" (p. 26). Moreover, American textbooks generally use easy problems, whereas textbooks in higher-performing countries include harder problems and with more frequency. It is reported that "American children's mathematics performance is [still] inadequate" (Ginsburg et al., 2012, p. 51), when compared to math performance in other nations. In 2009, only 33% of fourth-grade children in America were rated proficient, and 6% were rated advanced. This lack of math skills is especially true for students with learning disabilities (Meyen & Greer, 2009). More research is needed to help all students succeed in mathematics.

The Common Core State Standards Initiative (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010a) was a collaborative effort between key personnel from 48 states, 2 territories, and the District of Columbia, as well as teachers, school administrators, and math experts. The goal was to develop a roadmap of grade-specific standards, knowledge, and skills students should learn to be successful in our global economy. The standards are internationally benchmarked and backed by evidence showing that mastery of the standards will lead to readiness for higher education and the workforce (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010c). These standards focus on building both procedural and conceptual understanding of

whole numbers, addition, subtraction, multiplication, division, fractions, and decimals. The Common Core is designed to inform teachers, students, and parents about clear and realistic goals for success and to close the achievement gap across states.

Disadvantaged children from lower socio-economic status (SES) or poorly educated families find themselves in circumstances difficult to overcome. The NAEP report indicates that fourth and eighth graders scored higher in mathematics in 2011 than in previous assessment years (NMAP, 2008). Nevertheless, achievement gaps continue to persist among student subgroups (National Center for Education Statistics, 2011). Parmar and Cawley (1997) found that one subgroup, SWD, typically function two to four grade levels below expectancy across the mathematics curriculum. However, all students are affected by state and national standards. The Common Core State Standards in Mathematics document that SWD are expected to meet standards in the general curriculum classroom:

> Students with disabilities–students eligible under the Individuals with Disabilities Education Act (IDEA)–must be challenged to excel within the general curriculum and be prepared for success in their post-school lives, including college and/or careers. These common standards provide an historic opportunity to improve access to rigorous academic content standards for students with disabilities. The continued development of understanding about research-based instructional practices and a focus on their effective implementation will help improve access to mathematics and English language arts (ELA) standards for all students, including those with disabilities. (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010b)

The National Center for Education Statistics reported that 13.2% of students in the 2008-2009 school year were identified as having some form of disability (U.S. Department of

Education, 2011, Table 45). Of the group, 5% had specific learning disabilities, 2.9% had speech or language impairments, 1.0% had some form of intellectual disability, and 0.9% suffered from emotional disturbance. Though the percentage of public school students with specific learning disabilities being served by IDEIA (2004) decreased between 2004-2005 (13.8%) and 2008-2009 (13.2%), 2,476,000 students with specific learning disabilities is still a sizeable number who need help to succeed in school. Thurlow and Wiley (2004) analyzed data from the National Center for Educational Outcomes and reported that SWD were not only performing below all students nationwide, but that a significant increase in the gap will occur as these students get older. Forty-five percent of SWD in fourth grade perform below basic achievement levels, 55% at or above basic, 17% at or above proficient, and 2% at advanced achievement levels (National Center for Education Statistics, 2011). To put the achievement gap in perspective, SWD and average-performing students at the fourth-grade level have a 26-point average scale score difference. At the eighth-grade level, the difference increases to a 38-point average scale score difference. Such achievement gaps indicate that SWD need greater support from home, society, and school to succeed academically. Student achievement is shaped largely by forces outside school control, and is significantly affected by PI (Sui-Chu & Willms, 1996). As such, this literature review focuses on the home aspect, i.e., PI.

Focus on Parental Involvement.

Parental involvement has been found to play a significant role in student achievement, including academic motivation, a decrease in behavioral issues, and even educational reform (Civil et al., 2003; Epstein, 2005; Mcguinn & Kelly, 2012; Peressini, 1998). Many factors could account for the degree to which parents are involved, including but not limited to, grade and age

of children and their desire for independence, parental understanding of content area (Eccles & Harold, 1993), parental social networks and financial resources (Sheldon, 2002), parental life context (Hoover-Dempsey et al., 2005) or social economic status**,** parental educational level (Remillard & Jackson, 2006; Stevenson & Baker, 1987), and parental aspirations and expectations of their children's academic achievement (Levpušček & Zupancic, 2008).

There has been a call for greater parent involvement to improve student performance in the form of Public Law (NCLB, 2001 §1118). NCLB (2001) requires schools to involve parents in decision making and to offer volunteer opportunities. Epstein (2005) notes that the law "activates the theory of overlapping spheres of influence, which posits that students learn more and better when the home, school, and community share responsibilities for their success," (p. 180). The law includes examples of PI that mirror the six types listed in Epstein's framework of parent involvement. The U.S. Department of Education published a 32-page booklet on "Parent Power" and provided tips to help parents build bridges to success (2010). President Barack Obama issued a statement in 2009 on reforms in American schools, asking parents to take responsibility for their children's success. He said the following:

> To parents, we can't tell our kids to do well in school and then fail to support them when they get home. You can't just contract out parenting. For our kids to excel, we have to accept our responsibility to help them learn. That means putting away the Xbox and putting our kids to bed at a reasonable hour. It means attending those parent-teacher conferences and reading to our children and helping them with their homework (U.S. Department of Education, 2010, p. 5).

There has been research on parental help with homework (2005; Walker et al., 2004) and on parents learning more about standards-based curriculum to better help their children (Civil et

al., 2003, p. 6). But few studies have focused specifically on supporting home instruction (Chen et al., 2007) that is consistent with standards-based school instruction or on PI with children with disabilities.

Encouraging or increasing PI is complicated by the diversity of parental needs and the resources available to them. Parents do not often have the guiding principles needed to make difficult resource decisions. However, that does not mean they do not have "funds of knowledge" (Ginsburg et al., 2012, p. 61) with which to support their children. Ginsburg et al. (2012) encouraged parents to provide rich home environments to stimulate math learning, support the curriculum taught in school, and engage children in home activities that foster math learning. Research recommendations vary on how best to engage parents with their children to enhance school performance. Studies differ in reporting the level and nature of involvement, e.g., percentages of parents getting involved in instructional decision making, volunteering, and home learning activities, if at all (Huntsinger & Jose, 2009; Ji & Koblinsky, 2009; Wang & Fahey, 2011). Huntsinger and Jose (2009) note that Epstein's studies have focused on middle-class white families, which may not apply to other ethnicities and classes. Desforges and Abouchaar found differences among ethnic minority parents in the nature and impact of PI, but they noted that the "basic mechanism and the scale of impact is constant across all ethnic groups studied" (Desforges & Abouchaar, 2003, p. 37) . The researchers noted that PI is strongly related to socioeconomic status (SES), especially when it is measured by maternal education. There is a strong relationship between ethnicity and SES. Desforges and Abouchaar (2003) noted that many studies had neglected to take SES, type of PI, and subject area into consideration, resulting in ethnic differences. On the other hand, Fan and Chen (2001) found that ethnicity had a small effect on achievement, as opposed to different types of involvement and areas of achievement.

Epstein found that "with committed leaders, even schools and districts in the most challenging communities can make progress in implementing programs that increase the equity of PI and that support students' success in school" (Epstein, 2005, p. 181).

Theoretical Frameworks.

Three broad theoretical frameworks were used as bases for this study: Epstein's six types of involvement (Epstein, 1987, 1995; Epstein & Salinas, 2004) , Hoover-Dempsey and Sandler's motivations for PI (Hoover-Dempsey et al., 2005; Hoover-Dempsey & Sander, 1995; Hoover-Dempsey & Sandler, 1997), and Swap's (1993) home-school partnership framework.

Epstein's Six Types of Parent Involvement.

Epstein's framework defines six types of parent involvement that broadly included the most common definitions of PI in the literature (Ji & Koblinsky, 2009). The six types may be sorted into home-based and school-based involvement. Home-based types of involvement include (a) parenting, (b) learning at home, and (c) home-school communication. School-based types of involvement include (d) volunteering, (e) community involvement, and (f) decision making. A literature review by Desforges and Abouchaar (2003) noted that not all six forms of PI listed by Epstein (1998) actually affect student achievement. School-based involvement does not directly influence student achievement as compared to home-based involvement. Within the range of school-based involvement, the level of influence on achievement also varies. For instance, Desforges and Abouchaar (2003) posited that helping at a fundraiser may help raise funds for purchase of school supplies, but research has shown that how much a school spends on a student is not as influential as other at-home involvements. On the other hand, parents who go

to their children's schools to talk about their jobs and educational values can affect achievement through indirectly affecting students' motivations and aspirations.

Parenting.

Parenting refers to provision of care and includes supporting, nurturing, and rearing one's children, as well as creating a home environment that supports learning (Epstein & Salinas, 2004). For example, the authors reported that Madison Junior High in Naperville, Illinois, held discussions to raise parental awareness about parenting strategies and provided parents with opportunities to network with one another on important topics (Epstein & Salinas, 2004).

Parent involvement theories are generally put into practice through providing tips and strategies on good parenting. Parenting tips include how to teach a child organizational and prioritizing skills, how to set up educationally conducive environments, how to keep track of children's assignments and grades, how to motivate and reward students, etc. Parent resource provided by schools usually consist of school calendars, a child's grades for assignments, (Lunts, 2003), assessment standards, laboratory activities, examinations, and feedback about behavior in school. In focus group sessions, Guskey, Ellender and Wang (2006) found that the majority of parents studied wanted to understand what their children were learning and to be able to assist them better by having "computer, technology, math, and reading classes for parents so that they could learn the material their children received at school (pp. 20-21)."

Learning at Home.

Studies have indicated that activities encouraging parents to participate in home learning activities improved student outcomes in mathematics (Sheldon & Epstein, 2005). Success in mathematics is influenced by academic motivation that is shaped by cultural, familial, and societal contexts in which students live (Wang, Osterlind, & Bergin, 2012). Bartlo and Sitomer

(2008) believe that when parents engage in mathematical tasks with their children, they share their beliefs about mathematics, how they see themselves as learners of mathematics, and what their role is as a parent. Learning at home is about involving families with their children in academic activities that include completing homework, goal setting, and other academic-related activities. Also known as home assistance, Epstein defined learning at home as encompassing "encouraging, listening, reacting, praising, guiding, monitoring, and discussion–not teaching school subjects" (Epstein, 1995, p. 705). Civil and Bernier (2006) would argue that this limited view leaned towards a deficit or curriculum enrichment model where parents are not fully valued as intellectual resources, nor are conversations about mathematics teaching and learning facilitated. Epstein found that regardless of educational level, parents would like to be more involved and help their children succeed (Epstein, 1986). Parents may expect teachers to provide resources for involvement at home or may be able to find relevant resources themselves through the internet or other sources. Parents with different SES levels have been found to have varying levels of proficiency with finding information online that is relevant to their child or family issues. Parents with higher SES are more effective in advanced searches on search engines and are more discerning about the credibility of websites and information found online.

Strategies for learning at home include teachers sending weekly activities home with students that allowed the child to share and discuss interesting tasks with family members (Patall et al., 2008; Sheldon & Epstein, 2005; Walker et al., 2004). Quality engagement in home assistance is not just being aware of the existence of homework, but also being aware that one's child is attending school, is passing, and is not in trouble (Cattanach, 2013, p. 23). Cattanach suggests that parents should see that homework is completed, offer help, keep abreast of a child's

performance through dialogue with the teacher, assess areas of improvement, and consider how their children should be prepared for the future.

Levpuščcek & Zupancic categorized PI in the home into three dimensions: academic pressure, academic support, and academic help (Levpuščcek & Zupancic, 2008). Academic pressure refers to demands and expectations that a parent has of his/her child to maintain a high standard of performance. Academic support is setting up supportive domestic environments through showing interest in the child's learning, school activities, and future education, as well as showing pride and expectation in one's child. Academic help is observed as assistance with school work such as homework or studying for examinations. Academic pressure and help appear to have an inverse relationship with math achievement, whereas increased academic support is positively linked to achievement (Campbell & Mandel, 1990, as quoted in Levpuščcek & Zupancic, 2008). A meta-analysis of available quantitative studies was conducted by Fan and Chen (2001), and they found a small to moderate relationship between PI and student academic achievement. In particular, parental aspiration and expectation have the strongest relationship, whereas home supervision had the weakest relationship with student achievement. Cotton and Wikelund (1989) noted that parent involvement is most effective when parents work directly with their children in learning activities at home. Crites (2008) suggested that schools consider encouraging parents to check out learning activities from the classroom or a parent resource center, have suggestions sent home to parents for daily home instruction assistance, and suggest parents incorporate fun activities into their teaching.

Home-School Communication.

Many parents would like to help their children succeed in school but lack the familiarity with school systems and standards, especially if they were schooled in a different way or in a

different culture (Civil, 2009; Epstein, 1986). Parents who are already heavily involved tend to want even more involvement (Desforges & Abouchaar, 2003, p. 41). Technology can help (a) keep parents informed on current school curriculum and standards (Epstein & Salinas, 2004, p. 15; Peressini, 1998), (b) present a communication channel between parents and teachers (Lunts, 2003; Penuel et al., 2002, p. 65), (c) make students' educational participation and progress (Lynch & Lee, 2012) frequently available to parents, and even (d) offer access to guidelines on how to help children succeed academically (Walker et al., 2004). However, these channels need to involve two-way dialogues between educators and parents to be successful (Juniu, 2009; Mavrotheris & Meletiou-Mavrotheris, 2008; Peressini, 1998; Selwyn, Banaji, Hadjithoma-Garstka, & Clark, 2011; Staples & Diliberto, 2010; Williams & Chavkin, 1989).

Some parents would like information about several services, such as the range of afterschool programs that provide services for children who function below or above grade level, information about what children should be learning at different grade levels, ideas for creative educational games that help children view learning as fun (Guskey et al., 2006), or resources that help children with homework (Lahart, Kelly, & Tangney, 2009). Home-school communication is encouraged via improving the information flow between parents and teachers about school programs and student progress. Over the last few years, parents have been increasingly able to use websites to obtain updates of their child's performance. In 2006, Guskey, Ellender and Wang found that schools in their study did not have "school webpages or homework hotlines for parents to access information (p. 14)" about the school or children's classes. Parents wanted "information on a more regular basis and in a form that they can easily understand" (p. 23). The use of computer-mediated tools like video-conferencing, online chats, e-mails, and phone

conferencing also help to resolve scheduling conflicts between teachers and parents (Juniu, 2009; Lunts, 2003).

Lunts (2003) found that schools and teachers set up communication bridges through notes and letters that are either mailed home or hand carried home by students, school or classroom websites where updates are shared. In recent years, e-mails, blogs and wikis have been added to the list to build up two-way communication channels. These online sites also provide social calendars or requests for volunteers to help in school or community activities. Technologies like blogs (Ross, 2011), websites (Butler, Uline, & Notar, 2009), CDs, and DVDs (Mavrotheris & Meletiou-Mavrotheris, 2008) have been used as communication channels to increase parental awareness of student progress, homework, and school activities (Butler et al., 2009; Ross, 2011).

Ross (2011) suggested using blogs to give parents detailed glimpses into their children's classrooms and noticed a reduction of parent frustration and an increase in homework completion. She listed six tips for teachers to consider when creating posts for parents: (1) explain math terms that parents need to know and show examples, (2) post sample problems that are similar to those presented or worked on in class, (3) explain how the math learned may be used in the real-world, (4) present or explain a variety of strategies and how they are used, since each student problem-solves differently, (5) give suggestions of items within the home that may be used as math manipulatives, and (6) share links to educational websites that students can use to play math games or strengthen mathematical concepts.

Lunts (2003) suggests several components that are necessary for a school/classroom site to improve communication: (a) a welcome message for parents visiting the home page, (b) a section talking about what's new, (c) a school history section, (d) frequently asked questions, (e) school contact information, (f) faculty and staff showcase section, (g) extracurricular activities,

(h) library-media center, (i) section just for parents, (k) community information, and (l) tools for two-way communication. Other researchers (Butler et al., 2009; Salend, Duhaney, Anderson, & Gottschalk, 2004) have used websites to communicate with parents of students of disabilities regarding homework. However, research on electronic communications as a strategy for building family-school communications is still rather lean (Lunts, 2003, p. 8).

Volunteering.

Not all types of involvement are equally rewarding in terms of student motivation and achievement. Parental values about learning and achievement have the strongest relationship to motivations and competence (Marchant et al., 2001 as quoted in Gonzalez-DeHass, Willems, & Holbein, 2005, p. 121). However, researchers suggest that the most overt displays of involvement such as participating in school events may not always be the best option (Desforges & Abouchaar, 2003, Chapter 4, para. 10). Alternatives that are more focused on motivation and competence or that may sidestep issues of scheduling conflicts and parental transportation difficulties should be explored (Gonzalez-DeHass et al., 2005, p. 121).

Parent engagement via organized groups outside the home, like Stand for Children (STAND), 50-State Campaign for Achievement Now (50CAN), and Democrats for Education Reform (DFER), can be organized into three groups: voluntarism, advocacy, and empowerment (Mcguinn & Kelly, 2012). Engagement through voluntarism engages parents in activities like volunteering in classrooms and fundraising, which may have major impacts on student and school performance but "does not seek to fundamentally challenge or reform existing school practices or policies" (p. 12).

Community Involvement.

Building connections with business partners is a way to get involved with the community. Coordinating resources and services for families, students, the school, and business partners enables everyone to contribute to the community.

Decision Making.

Parents involved in decision making can join school parent associations or advocacy groups like Stand for Children (STAND), 50-State Campaign for Achievement Now (50CAN) and Democrats for Education Reform (DFER). In the call for greater school system transparency, some organizations educate parents how to interpret state standards and assessments, student and school performance data, and state performance data. Parents are empowered to create their own agendas for improving schools, and they may want to change the status quo and influence policy reforms by mobilizing other parents for political action.

Hoover-Dempsey and Sandler's Motivations for Parent Involvement.

The basic tenets of the Hoover-Dempsey and Sandler (Hoover-Dempsey et al., 2005) framework of parent involvement were implemented within the context of learning at home. Parents get involved for many reasons, and Hoover-Dempsey and Sandler have divided the process into five levels to explain parent involvement. These include how parents decide whether or not to become involved, in what manner, to what extent, and how child outcomes are influenced by their involvement. The five levels are (a) the PI decision, (b) learning mechanisms engaged in by parents during involvement activities, (c) student perception of learning mechanisms engaged in by parents, (d) student proximal attributes conducive to achievement, and (e) student achievement. Of interest in this research study is the finding that teacher and

child invitations are highly effective in getting parents involved. Plus, when teachers provide specific, targeted, and sensitive homework invitations to parents, children's learning beyond the school setting is more productive.

Level One.

Personal Motivators.

Level one of the parent involvement framework refers to the parent's positive decision to become involved. Involvement forms include (a) sharing of values, goals, expectations, and aspirations with one's child, (b) engaging in activities at home, (c) engaging in communications with teachers and the school, as well as (d) engaging in activities at school (Walker, Shenker, & Hoover-Dempsey, 2010). The decision to be involved is influenced by personal motivators, perception of contextual invitations to involvement, and school or program responsiveness to family life context variables. Personal motivators are shaped by two influencers, (a) parental role construction and (b) sense of efficacy for helping their child succeed in school.

Parental role construction refers to the way parents view their role in education and how it affects how involved they are. Hoover-Dempsey et al. (2005) define parental role construction as a "sense of personal or shared responsibility for the child's educational outcomes and concurrent beliefs about whether one should be engaged in supporting the child's learning and school success" (p. 107). One group of parents feels that education is the sole responsibility of the school and therefore does not feel the need to be involved in the school. The other group feels they are responsible for their children's education and want to be heavily involved, both in and out of school.

Parents' role construction is socially constructed and based on beliefs about how children develop, how to raise children effectively, and what kind of home support is needed to help

children succeed in school. Parents' beliefs about the significance of their help in specific learning areas increases positively when teachers make recommendations on how they can help students succeed (Hoover-Dempsey et al., 2005). Parents' past experiences include his/her own time in school, involvement at the child's school, and interaction with members of the school. Parents who have active role construction for involvement take on active roles in their children's education. Hoover-Dempsey et al. (2005) posited that school attributes and well-designed intervention programs may also influence parental role construction.

Parents' self-efficacy levels affect how much they wish to help with homework or provide feedback and guidance. Providing homework help may cause "some parents stress or feelings of inadequacy due to perceptions of their own ability. (Civil & Bernier, 2006, p. 316) "Desforges and Abouchaar (2003) found that parents with higher education tended to have higher self-efficacy levels. However, research shows that regardless of socioeconomic status (SES) and educational level, all parents can get involved in talking about school-related issues—the most important way to affect student achievement. Some programs have been created where students teach parents what they have learned as a form of school-related discourse. Other programs request that both parents and teachers get involved in projects using a teacher-provided toolkit or have parents and students quiz one another.

A significant difference exists in the way parents, students, and teachers perceive PI behaviors (DePlanty, Coulter-Kern, & Duchane, 2007, p. 367). Parents tend to hold lower expectations for PI and report higher involvement than that expected or discerned by students and teachers. Teachers and students value parent involvement in academics at home as being more important than school involvement (DePlanty et al., 2007). The call for greater PI should be accompanied by clearer roles for active role constructions.

Parental sense of efficacy is the belief that one's abilities to act in certain ways will produce desired outcomes in children's learning. Parents appraise their own capabilities to build a sense of efficacy which affects effort and persistence in working towards a goal. Researchers have found that most, if not all parents, want to be involved regardless of educational level, socio-economic status, and ethnicity (Epstein, 1998; Huntsinger & Jose, 2009). However, parents have been observed to do relatively little or have reservations about becoming involved in their children's education, especially in mathematics, since they do not feel sufficiently proficient in math (Ginsburg et al., 2012). Parents with a strong sense of efficacy will tend to make positive decisions about how active they intend to be in their children's education and will persist in the face of challenges toward successful outcomes. In a study of parent-school involvement and school performance, ethnicity was a moderator among socioeconomically comparable African-American and Euro-American families (Hill & Craft, 2003). An ethnic difference exists and suggests that African-American parents are less likely to have informal social networks that include other parents in the school as compared to Euro-American parents. This leaves them less aware of school expectations and therefore indications of what they can do to help their children with mathematics learning.

Grolnick, Benjet, Kurowski, and Apostoleris (1997, as cited in Hoover-Dempsey et al., 2005) reported that parents with stronger sense of efficacy were more active in (a) behavioral, (b) cognitive-intellectual, and (c) personal involvement. Behavioral involvement is participation in school activities and providing children with help at home. Cognitive-intellectual involvement refers to engaging children in intellectually stimulating activities. Personal involvement is monitoring the child's progress at school. Attributes that affect a parent's sense of efficacy include: aspirations for one's child and belief in the child's abilities, parental ability to manage

work/life schedules and involvement, and parental sense of empowerment in supporting one's child. Self-efficacy, like role construction, is a social construct grounded in personal experiences. Experiences may include personal success, observing others' success, encouragement from key others, and one's physical and affective states as one processes one's ability to reach assigned goals. Hoover-Dempsey et al. (2005) suggested that schools "exert significant influence on parents' sense of efficacy for helping their children succeed in school." (p. 109)

Remillard and Jackson (2006) claimed that even though there is a call for increased parent participation and involvement, changes in the mathematics curriculum have disempowered parents. Peressini (1998) noted that parents were left out of the math curriculum planning process and are therefore unable to engage in mathematics education activities, such as assisting with homework. This has negatively impacted their sense of self-efficacy. More than a decade later, parents are still "ignorant about the performance of their child's school and that much of what they think they know is incorrect" (Mcguinn & Kelly, 2012, p. 5). Parents then only get involved through "monitoring" homework and encouraging "mathematical development" (p. 575).

In 2000, the National Council of Teachers of Mathematics (NCTM) prompted reform of mathematics curriculum standards, which promoted "a view of mathematics unfamiliar to most parents in the United States" (Remillard & Jackson, 2006, p. 232). Van Voorhis (2011) noted that the MetLife Foundation (2007) found that parents most frequently indicated mathematics as the subject in which they felt least prepared to help their children, and this was true of 33% of parents of elementary children and 53% of parents of secondary children.

Many parents do not have the know-how to create positive learning environments at home that foster learning and are "coordinated with classroom work" (Mavrotheris & Meletiou-

Mavrotheris, 2008, p. 350). In this age of technology, there are still parents who do not know how to access information online to check their child's attendance or completion of homework and feel intimidated by the education system (Cattanach, 2013). Gal and Stoudt (1995) are cited by Sheldon and Epstein (2005) as suggesting at least three reasons why parents may not be involved. One, mathematics increases in difficulty as children progress through the grades. Second, teachers are not taught how to guide parents to assist students in mathematics. Third, the way mathematics is being taught in school may have changed radically from when parents first studied it. With an imminent move to the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010a), classroom math instruction will take on a new approach that is also not familiar to parents.

Educators often turn to homework to improve student achievement (Van Voorhis, 2011, p. 314). According to Desforges and Abouchaar (2003), unlike teachers, parents are not trained to interpret state standards in real-world terms. Some schools set up training workshops to teach parents with teacher resources so they understand what their children are learning and are able to empathize with their children when difficulties arise. In a study of eight schools, all parents and guardians indicated that they helped their children with homework (Guskey et al., 2006). Parents, in a display of varying levels of self-efficacy, utilized a variety of strategies for coping with situations when the homework was too difficult for them. "Some parents sent unfinished homework back to the teacher, others looked for outside sources of help, and still others asked the teacher for help (Guskey et al., 2006, p. 19)." Remillard and Jackson (2006) note that parents often find it difficult to make sense of the tasks in their children's standards-based schoolwork and are therefore unable to help. Some parents feel that "math consisted of following a set of rote procedures" (Ross, 2011, p. 260) when they learned math instead of "not only skills but also

concepts and problem solving (p. 260).” This is especially so because standards-based instruction places emphases on how well children understand mathematical concepts instead of acquiring skills. This is a different approach from what parents experienced. Students are inclined to become frustrated with the way parents help them with homework, because their teaching approaches and methods may differ from those teachers use. Frustration may be shown in statements such as, “That’s not the way my teacher taught me! I can’t do it like that (p. 260).” Cooper described this phenomenon as “parental interference” (Cooper, 2001, p. 35), which has caused some children to experience emotional and mathematical trauma (Lange & Meaney, 2011).

However, Leone and Richards (1989) found that the mood of students in grades 5 through 9 improved when parents were involved in homework. Students did not report being as unhappy or disinterested as they did when they were doing homework alone (Van Voorhis, 2011, p. 318). Although the study by Van Voorhis could not identify a cause for the difference in feelings about math, it suggested that one possible explanation could be the experience of parent and student working together with “better or clearer instructions about how to complete math skills and how to discuss the use of math skills in real-world situations” (Van Voorhis, 2011, p. 330).

In order to combat the problems discussed, parents can do more for their children through learning support and instruction skills at home. Parents may find resources on their own or be given resources by teachers. Ginsburg et al. (2012) have suggestions for resources, including the *Parent resource* page on the National Council of Teachers of Mathematics website, which provides downloadable guides for children of all ages. Another website by the New Jersey Network Foundation’s Education department has more than 440 videos providing descriptions of

mathematical concepts, videos to demonstrate those concepts, and downloadable activities to help parents support their children's understanding of key math concepts. There are many online resources available to parents, but Ginsburg et al. remarked, "Ensuring that these online resources are available to and used by disadvantaged families whose children are most in need remains a challenge" (Ginsburg et al., 2012, p. 58). Any resource designed for parents to better understand their children's math instruction "should build on parents' previous experiences as well as help parents use those experiences to relate to tasks" (Remillard & Jackson, 2006, p. 20) with which their children can be engaged.

Invitations to Involvement.

The three most important sources of invitations to involvement in the Hoover-Dempsey and Sandler model come from (a) the school, (b) teachers, and (c) students (Hoover-Dempsey et al., 2005). Invitations are particularly significant for parents with passive role construction and/or weak sense of efficacy. Receiving invitations to be involved is often a key motivator for parents to become actively involved (Hoover-Dempsey & Sandler, 1997).

Parents feel welcomed and valued by the school when invited to participate in their child's learning and feel that their involvement is expected. Teacher invitations emphasize the importance of PI and how it can affect learning. Student invitations motivate parental responsiveness to their children's learning needs. Hoover-Dempsey et al. (2005) suggested that invitations must be "developed and offered before they can be perceived" by parents. They suggested that invitations be framed to maximize parental responsiveness. The school principal plays a big role in developing positive school staff attitudes. By making a school commitment to engage parents in meaningful roles and provide feedback, principals can build environments that empower parents and make them feel welcome.

School administrators want to get families involved but do not know how to develop a good and productive program (Epstein, 1995). For instance, parents of students with attention deficit hyperactivity disorder (ADHD) rate themselves as less effective in helping their children academically as compared to students without ADHD. Fathers also tend to be less involved (Civil & Bernier, 2006; Epstein, 1995) or are engaged in aversive discourses (Rogers et al., 2009) even though their behavior affects children's perceived competence and self-regulation (Gonzalez-DeHass et al., 2005). Other barriers include language skills, home/school partnerships, work interference, knowledge of the school system, self-confidence, parents' past experiences (Antunez, 2000, pp. 55-56), lack of internet access (Lunts, 2003), and the perception that there is little parents can do to affect changes (Hoover-Dempsey et al., 2005, p. 116). Some parents did not want menial tasks when being involved and desired more equal partnerships with teachers (Civil & Bernier, 2006). Schools need to take such contexts into consideration when planning for or initiating parent outreach programs.

Ginsburg et al. (2012) reported that programs were designed to provide parents with structured activities that help build children's math-readiness skills. A European educational consortium was established to plan a program to train parent educators, Success in Math and Science at Home (SMASH) (Mavrotheris & Meletiou-Mavrotheris, 2008). Program information is available online and in CD/DVD format to overcome bandwidth limitations. The program is designed to provide parent educators access to a self-paced course in hyper textbook format. It includes parent training packet for distance learning or parent independent study, and it offers collaborative tools to support dialogues between parents and trainers. Some of these tools include: discussion forums, chat rooms, and application sharing so trainers can conduct workshops for

parents. In cases where parents are unable to attend training, they will still have online access to the educational aids and resources.

Other programs include Family Math/EQUALS for prekindergarten to ninth grade, which offers games and activities and hands-on materials that can be found at home. An online guide, Helping Your Child Learn Math, provides ideas and instructions for activities that can be completed at home, the grocery store, on the go, or simply for the fun of it. Other programs that have been used to engage parents in school instruction include math nights (Epstein & Salinas, 2004). Epstein and Salinas (2004) portrayed math night at Woodridge Primary School in Ohio as an opportunity for families to learn about the state's math standards, experience teacher-led math sessions on ways to help their children learn math at home, and receive bags of math resources including state standards.

Teacher invitations spark two-way communication and help to develop trust in the parent-teacher relationship as well as a sense of partnership. Invitations also address concerns that parents have about overstepping their roles relative to teachers (Williams, Williams, & Ullman, 2002). Williams et al. (2002) have found that teacher education programs do not prepare preservice teachers to fully engage parents in students' education. Even if teachers have been exposed to technologies that support teaching, few actually use what they learned once they are in the field. New teachers are rarely really prepared to engage parents, and it has been documented that parents and teachers conceptualize family involvement differently and are therefore wary of each other (Christenson, 2004). For instance, Civil and Bernier (2006) noted that a first-year teacher involved in the program, Math and Parent Partners, "could not see past his own idea about teaching and was critical of some of the [parent] presentations that he attended." Another teacher, with 15+ years of teaching experience recognized those parents had

growing pains that were similar to what first-year teachers experienced. She said that parents would get used to facilitating math workshops "after they do it two or three times. They get used to it; it's like a first year teacher. It's not a problem; it's just a matter of experience. (Civil & Bernier, 2006, p. 327)" According to Christenson (2004), teachers want to get families to support school values and practices, while parents want schools to be more responsive to the needs and aspirations of their children. Rarely do they discuss how to work together to help students succeed. Parents, especially those with low socioeconomic status, may not have had positive experiences in school and may still feel hesitant to communicate with teachers. Researchers found that teachers tend to have lower expectations and more negative perceptions of low-SES students as compared to higher-SES students (Arnold & Doctoroff, 2003, p. 518 as cited in Ginsburg et al., 2012). Ginsburg, Duch, Ertle, and Noble (2012) believe that since disadvantaged children are at risk of both school failure and attending failing schools, parents need to be more involved to help their children learn, especially mathematics.

Most parents want to help their children with homework but don't know how (Epstein, 1986; Ross, 2011), because of generational differences in the curriculum (Bartlo & Sitomer, 2008). Teachers may invite parents to be involved in a variety of activities, include them in students' interactive homework, or encourage them to attend math workshops designed specifically for parents. Teacher invitations to be involved in homework should coincide with parental desire to know more about how to support their children's learning (Epstein, Salinas, & Van Voorhis, 2001). Parents generally need specific suggestions about how they can help at home (Guskey et al., 2006). Some researchers reported that the use of homework requiring parent-child discourse "can (a) create a line of communication between parents and teachers, (b) increase family involvement, and (c) help improve student achievement. (Sheldon & Epstein,

2005, p. 197)“ Findings like this inspired projects like the Teachers Involve Parents in Schoolwork (TIPS) (Patall et al., 2008; Sheldon & Epstein, 2005; Walker et al., 2004), manuals and activities for elementary and middle school (Epstein et al., 2001), and the INSPIRE project (Bateson et al., 2000), where opportunities were created for parents and caregivers to work on activities with students alongside teachers (Bateson, 2000, p.56). TIPS has students demonstrate mastery of new mathematics skills for parents and then discuss the use of mathematics in daily life (Sheldon & Epstein, 2005). However, Walker (2004) notes that TIPS parents were asked to be interested and responsive but asked not to teach specific skills. Desforges (2003) described INSPIRE as targeting one class per school and having each student bring an adult to school to work collaboratively with the teacher on activities consistent with the math curriculum.

All parents want to be of help to their children, and student invitations activate parental wishes to be responsive and available to their children (Hoover-Dempsey et al., 2005). Children’s invitations may be implicit as well as explicit. The former happens when parents observe children struggling with learning and then make themselves available to offer instruction or to monitor schoolwork. Explicit invitations include homework help requests, participation in school events, etc. (Hoover-Dempsey & Sander, 1995). Student invitations may be prompted by teachers who seek parent involvement. Invitations may also be prompted by schools attempting to increase the relevance of school learning into the home, such as homework that builds on normal family activities (Epstein et al., 2001; Van Voorhis & Epstein, 2002).

Responsiveness to Family Life Context Variables.

The Hoover-Dempsey and Sandler framework presents three key life context variables, (a) parental knowledge and skills, (b) time and energy, and (c) family culture. An overarching

variable that helps us understand parents' involvement decisions is family socioeconomic status (SES). Research suggests that a strong relationship exists between SES and PI, "The higher the social class, the more PI was evident" (Desforges & Abouchaar, 2003, p. 21). However, SES does not explain why parents get involved, nor does it explain why parents of similar SES vary in involvement practices (Xu & Corno, 2003). Regardless of SES and educational levels, all parents are able to get involved in the most important way to affect student achievement–by talking about school-related issues. "Parental involvement made a significant unique contribution to explaining the variation in children's academic achievement over and above the effects associated with family background." (Sui-Chu & Willms, 1996, p. 138). Schools should not make negative assumptions about SES and parental ability or level of involvement, since negative assumptions inversely affect role construction.

Feasibility of involvement in activities is influenced by parents' knowledge, skills, and the likelihood of success. Parents provide direct assistance when they perceive their knowledge of subjects and content as well as skills are adequate (Hoover-Dempsey et al., 2005). If perceived as inadequate, parents often seek help from family members, the child's school or teacher, or more knowledgeable others, and reduce direct involvement. Knowledge also refers to an understanding of child development and the need for autonomy. As children mature, PI changes to support different needs.

Parental time and energy also affect the decision to be involved. Parents with demanding jobs, inflexible employment schedules, or multiple jobs, tend to be less involved, especially at school. However, they do make it a point to get involved in ways that are in sync with personal role construction and self-efficacy perceptions.

Family culture is a key construct that schools need to respect and respond to in their efforts to gain parental support for student learning. School administrators need to consider SES, resource limitations, as well as language barriers, limited understanding of school expectations and policies, family versus U.S. mainstream values or priorities, and how parents are already involved at home in ways that schools are not able to see. Steps that invite additional involvement may not include practices that schools are familiar with, including families' use of real-world concepts or homemade homework (Epstein et al., 2001). Schools and teachers can initiate outreach programs to empower parents by using math games to give SWD in regular classrooms more time to practice and understand math concepts (Garrison, 2007), preparing educational toolkits parents can check out or receive monthly (Crites, 2008; Staples & Diliberto, 2010), and getting parent feedback when designing educational materials for parents (Menghini, 2005).

Level Two.

Level two refers to learning mechanisms that parents engage in, including (a) encouragement, (b) modeling, (c) reinforcement, and (d) instruction (Walker et al., 2010). The mechanisms are research-based and well-known in the field of educational psychology. Encouragement is used to enhance the quality of parent-child interactions. It is assumed that when parents encourage their children, children become more open to parenting efforts. Walker et al. (2010) added modeling to the framework, based on Bandura's (1986) work, reinforcement based on Skinner's (1989) behavioral theory, and instruction, based on Vygotsky's work. They assumed that "parents contribute to enhanced student outcomes when they *encourage* and *model* important learning skills such as persistence in the face of difficulty; *reinforce* behaviors and attitudes related to learning such as managing time wisely; and *instruct* their children about ways

to enhance learning such as breaking down a problem into smaller, manageable pieces" (p. 29). While experimenting with engaging parents as math workshop facilitators in the program, Math and Parent Partners, participating teachers noted how important it was for children to see their parents tackling the challenging subject (Civil & Bernier, 2006). According to Hoover-Dempsey and Sandler (1995), parents can engage children in direct instruction that is closed-ended or open-ended. Closed-ended methods "promote factual learning, but will not tend to influence the child toward higher levels of cognitive complexity" (p. 321), whereas open-ended methods "will tend to promote higher levels of cognitive complexity and ability as well as factual knowledge." Huntsinger and Jose (2009) cited the publication, Homework Tips for Parents from the U.S. Department of Education (2003), as suggesting that parents should be aware of how their children are being taught math, and not to teach strategies and shortcuts that conflict with the approach the teacher is using."

Levels Three through Five.

Level three looks at student perceptions of the four learning mechanisms engaged in by parents in level three. The model assumes that student's perceptions of their parents' involvement and actions will mediate student outcomes. The level asserts that learning is an interactive process between parent and student and is based on constructs like Piaget's (1952) constructivism and Bandura's (1986) and Vygotsky's (1978) social learning theories.

Level four refers to a range of student outcomes influenced by levels two and three. It discusses proximal learning attributes conducive to achievement, such as (a) academic self-efficacy, (b) intrinsic motivation to learn, (c) self-regulatory strategy knowledge and use, and (d) social self-efficacy in relating to teachers. Level five pertains to student achievement after having experienced PI. Level four attributes are primarily focused on the development of children's

attitudes and behaviors, whereas level five focuses on the trend of regarding student achievement as a significant outcome of PI.

Swap's Home-School Partnership Framework

In her book, "Developing Home-School Partnerships: From Concepts to Practice," Swap (1993) posited four frameworks of parent involvement based on Epstein's (1998) six types of parent involvement. The choice of framework that a school adopts depends on "values of families and educators and the needs of the children. (p. 47)" They are the protective, school-to-home transmission, curriculum enrichment, and the partnership frameworks. Epstein wrote in the foreword that she found the first three frameworks inadequate.

> "She discusses what I see as three less-than-true, less-than-adequate partnership approaches: (1) a 'protective model' that seeks to reduce conflict by discouraging contact – an anti-partnership approach; (2) a 'school-to-home transmission model' that supports only one-way communication; and (3) a 'curriculum enrichment model' that limits involvement to parent support, information, and resources to improve the curriculum of the school and classroom – a necessary but not sufficient component of a comprehensive program. (Swap, 1993, p. ix)" – Epstein

Epstein supported the fourth framework, the partnership model, which Swap noted could bring about school reform. Epstein felt that it included her six types of involvement in a comprehensive program. The elements of the partnership model are also observed in Hoover-Dempsey and Sandler's model. Swap's partnership framework has four elements, (a) creating two-way communication between parents and educators; and (b) enhancing learning at home and at school through having high expectations, providing conducive learning environments,

emotional support, modeling and enforcing discipline, and providing guidance and encouragement. Parents and educators work collaboratively to develop ways in which parents can be involved within and outside the classroom. Parents "understand what is occurring in the curriculum and ways in which they can monitor, assist, or extend children's homework." The third element is (c) providing mutual support between educators and parents through the provision of school-initiated educational programs for parents and parental volunteering in school. The last element is (d) making joint decisions to improve the school by participating in council, committee, and planning and management teams.

Blending Assessment with Instruction Program (BAIP).

The Blending Assessment with Instruction Program (BAIP) was developed by the eLearning Design Lab (eDL) at the University of Kansas (Meyen & Greer, 2009, 2010b) for all students. It was a collaborative project involving more than 100 educators over a 5-year period who developed and tested 280 mathematics lessons, 310 mathematics tutorials, and 740 mathematic terms across all standards (Meyen & Greer, 2009). Since the program is being aligned with the Common Core State Standards, additional resources have been added. There are now 350 mathematics lessons and 405 tutorials. The motivation to develop the BAIP emerged in the context of the tasks required teachers to translate standards into instructional plans for classroom application. Considerable content knowledge and time are needed to translate standards into aligned instruction (Thurlow & Wiley, 2004). Instructional planning is very important for teaching mathematics to struggling learners and students with learning disabilities (Meyen & Greer, 2009). Prior to the Common Core State Standards, Schimdt (2008) pointed out that unlike the top math-performing countries, U.S. standards lacked focus, rigor, and coherence.

The language used to explain standards has complicated the translation process (Gewertz, 2010), thus adding to the challenges faced by teachers in instructing struggling learners.

The BAIP was designed to assist teachers to align classroom instruction with curriculum and state assessment standards for all students, including SWD. Development priority was placed on the design and development of research-based lessons for teachers, self-paced online tutorials for students, and a management system allowing immediate feedback to learners and teachers. During field testing between 2007 and 2009, researchers (Meyen & Greer, 2010a, 2010b) found that the most frequent use of the BAIP tutorials was at grades 4, 5, and 6. Data suggested that increased use of the BAIP student tutorials resulted in higher performance on state assessments. Of all students who completed BAIP tutorials, students with IEPs had unchanged performance over the two years whereas students without IEPs increased significantly in their performance. As a result of field testing the lessons and tutorials, teachers made several reports; one, that struggling learners found the reading required to complete tutorials to be difficult. Two, there was a need for a parent resource that is consistent with classroom instruction that will help to enhance instructional support at home. Development of the parent resource occurred during 2008 and 2009.

The parent component of the BAIP was added in 2009 and includes parent activities that are consistent with concepts and skills taught through the lessons and tutorials, tip sheets, and an animated dictionary. The BAIP's other primary elements include standards-based lessons for teachers in mathematics that have complementary online, self-paced tutorials for students in grades three through high school. The alignment of the lessons and tutorials has been validated, and they are currently being aligned with the Common Core State Standards. The BAIP requires accounts for access: teacher, student, and parent.

Teacher Lessons

Teacher lessons are available only via Teacher accounts. The BAIP lesson format includes five frameworks that have been shown to be essential for effective instruction: Contextual, Teaching, Lesson, Application, and Extension. Each lesson begins with the contextual framework, stating the state standard, benchmark, and indicator the lesson will address (Appendix I).

The teaching framework is designed to enhance teachers' understanding of the standard that the lesson will address and to show them how to translate standards into instructional plans. Each teaching framework consists of an overview, identification of prerequisite skills and concepts needed for the standard, and then lists skills and concepts students should learn to master the standard.

The lesson framework is the instructional component used to teach the concepts and skills addressed in the lesson. It uses a scripted approach and includes teacher prompts and student responses. Instructional steps for concrete modeling and demonstration are accompanied by a corresponding PowerPoint presentation. Step-by-step instructions demonstrate how to teach the concepts and simulate possible reactions that students may have as a result of instruction. This scripted approach includes the "addition of explicit instruction help to provide teachers with time to reflect on their students' instructional needs, experiences, ability, and knowledge levels" (Meyen & Greer, 2009, p. 7). The application framework provides both guided and independent practice through worksheets and/or activities. It also incorporates concrete, open-ended, and reflective validation questions to gauge student understanding and knowledge throughout instruction.

The extension framework provides additional concrete to abstract activities and suggestions for students with learning disabilities or students in need of academic enrichment. The BAIP utilizes both a scripted approach and explicit instruction, since they have been shown to help improve student abilities in problem solving (Meyen & Greer, 2009). Explicit instruction consists of probes, repeated feedback, individualization, step-by-step instructions, pictorial diagrams, small-group instruction, and direct questioning. Providing scripts encourages teachers to spend lesson-planning time reflecting on student experiences, strengths, and weaknesses and thus to plan motivating and interesting instruction.

The BAIP Lessons are supported by student tutorials that are also consistent with math standards in grades three through eight and high school.

Student Tutorials

Online student tutorials are consistent with lessons and standards and represent an extension of classroom instruction (Appendix II). The tutorials were subjected to extensive content validation and alignment to provide content quality assurance and to further reinforce teachers' content knowledge. Each indicator has at least two tutorials, each including (a) key idea, (b) how to use the key idea,(c) four practice questions followed by instructional feedback, (d) review of key idea as used in the questions, and (e) a summary of what the student has learned. Students are allowed retries to encourage independent learning.

Teachers assign students tutorials that are complementary to classroom instruction. Teachers are able to immediately retrieve student performance data, adding to the content knowledge strength of the BAIP system. Students log in to the BAIP system with their user IDs

and complete assigned tutorials at their own pace. Detailed explanations and examples in Key Idea and Reviews promote further independent study.

Parent Resource

Early in the field testing phase of the BAIP lessons and tutorials, teachers shared their observations on the need for a parent resource that is consistent with the BAIP lesson content and student tutorials (Meyen & Greer, 2010a, 2010b). The need for such resources was felt to be especially important for parents of SWD and other struggling learners. Teachers felt that such a resource would help parents understand the concept of a standards-based curriculum and the instruction their children are receiving. It could help parents make better-informed education-related decisions. Parents would also be better equipped to assist their children at home in learning skills and concepts currently being taught at school.

The BAIP parent online resource includes three sections: (a) parent activities complementary to lessons being used by teachers, (b) a series of tip sheets on general issues that crop up when parents work with their children on school-related tasks and, (c) a dictionary to help parents understand the math language used by their children's teacher (Appendix III).

Parent activities are tied to indicators that operationally define each standard. Activities may be accessed and used online or downloaded and/or printed in hard copy. Each parent activity has an introduction, three structured activities, and two teachable moments. The introduction provides an overview to the activities by presenting basic information about the standard, the benchmark, and the indicator pertaining to the activities. The Structured Activities segment models a scripted lesson and is designed to increase the parents' ability to provide instruction and content knowledge. It tells parents what materials are needed, concepts that will

be addressed in the activity, and details step-by-step instructions on completing the activity. Finally, the Teachable Moments component suggests how the standard just learned can be applied to an age-appropriate real-world experience through a problem task. Most of these teachable moments and structured activities can be completed at home. Once parents and their children have worked through an assigned parent activity, parents can send feedback to teachers by going back to the online resource and indicating that an activity has been completed. They may also rate the effectiveness of a given activity on a scale of 1 to 5 and send additional comments to teachers. Once a parent activity has been assigned, continuous access is allowed so parents may return to past activities at their own leisure.

Tip sheets cover a range of topics, including motivating one's child, building study skills, teaching one's child, and building open communications. The Tip Sheets are clustered around cognitive and associated tasks. Like the other elements of the BAIP model, Tip Sheets are presented online and may also be downloaded and printed in hard copy.

The dictionary is more than a glossary of terms, since it takes on an online visual and/or virtual approach to teaching math terms. Because parents may not be familiar with current math terminology, the dictionary was intended as a resource for parents to use with their children when assisting with homework or for generalized use in applied situations at home and in the community.

Summary of Literature Review.

This research study examines a variety of issues, including but not limited to parent engagement and motivation (Hoover-Dempsey & Sandler, 1997; Walker et al., 2010), parental help with homework (2005; Walker et al., 2004), and parents experiencing standards-based

curriculum to better help their children (Civil et al., 2003, p. 6), especially SWD. Few researchers have focused specifically on the issue of PI or parental interference when supporting home instruction (Chen et al., 2007) of SWD and when curriculum is aligned with the new Common Core State Standards for Mathematics.

The value of parental engagement to support their students through reinforcing classroom instruction during nonclass time is apparent, but there is little evidence that parents are receiving sufficient resources to enhance their roles as partners in their children's mathematics education (Remillard & Jackson, 2006). Parents do not know how they may best help their children to learn math. In addition, few fully online versions of instruction-aligned, standards-based parent resources are available. Most such programs take the form of one or a few types of PI as discussed in the theoretical frameworks and make certain assumptions about parents' decisions to be involved. Examples include workshops or math night events at children's schools (Mavrotheris & Meletiou-Mavrotheris, 2008) and the provision of resources designed as management systems to keep parents abreast of their child's schedule, homework, and progress. Few structured systems are in place to provide instruction-aligned resources consistently throughout the year, especially for SWD.

The introduction of the BAIP as an intervention has provided an opportunity to understand how parents support their SWD with resources that are consistent with school instruction and the Common Core State Standards for Mathematics.

Chapter 3: Methodology

Overview

As discussed in Chapter 1, many students' math performance is not where it needs to be. This performance gap is cause for national concern among educators, policy makers, and parents. This study was designed to better understand one approach to parent engagement that enhances the math performance of their children. Research shows that home-based PI, such as parent-child dialog, is more effective in helping students succeed in school than participation in parent organization or volunteer activities (Desforges & Abouchaar, 2003). Standards-based instruction can create conditions that facilitate teacher communication with parents on what their children are being taught and the performance expectations. An argument can be made for the importance of conducting qualitative research to inform how best to engage parents in reinforcing instruction offered by teachers and to provide instructional support for students during non-school time.

This research addresses that need through qualitative research methods that investigated the implementation of the Blending Assessment with Instruction Program (BAIP) parent resource in a private school that serves students with learning disabilities in grades 3 through 12. The BAIP resource is essentially three websites with resources for teachers, students, and parents. Each website requires an account for access. The teacher site provides teachers with a math dictionary and lessons via a catalog. Each teacher lesson is written to teach a specific math standard and has a complementary handout. Each lesson has at least two corresponding online student tutorials and a parent activity. The student site displays corresponding teacher-assigned tutorials. The parent site shares teacher-assigned parent activities, a math dictionary, and tip sheets for supporting student learning. All BAIP teacher, student, and parent resources are

aligned to one another and to the Common Core State Standards, and thus may be implemented as a coordinated instructional experience. This study utilized the teacher lesson, student tutorial, and parent activity components of the BAIP.

I investigated the experiences of six teacher-parent-student triads engaged with the BAIP. This process involved a consistent set of resources: teacher lessons for teaching, students practicing learned concepts via online tutorials, and parents utilizing resources designed for home instruction. Although the research procedures are described sequentially, some steps occurred concurrently.

Research Design

Merriam (2009) described qualitative research as trying to understand the meaning that people have constructed and the key concern is in "understanding the phenomenon of interest from the participants' perspectives" (p. 14). Case studies have "proven particularly useful for studying educational innovations, evaluating programs, and informing policy" (p. 51). As such, qualitative research is the best approach for understanding the experiences of parents, teachers, and students when engaged in BAIP resources. This approach is preferred to surveys as Guba and Lincoln (1985) note that "qualitative methods are preferable to quantitative methods when the phenomena to be studied are complex human and organizational interactions and therefore not easily translatable into numbers" (Skrtic, 1985, p. 188; Wieman, 2014). Qualitative research also allows a focus on words and meaning derived inductively from what people say in specific situations (Maxwell, 2005).

Gutiérrez and Penuel (2014) recommend new approaches to research and development where "researchers observe everyday practices and conduct interviews with stakeholders to

identify contradictions within and across the various levels of the system under study. (p. 20)“ In the present study, the focus is on the words and meanings spoken by members of the triads during interviews and during observation sessions as parents engaged their children in activities from the BAIP parent resources. The qualitative method allowed me to delve into the thoughts, behaviors, and feelings of participants as they recalled and interpreted real-life experiences in implementing the resources. This study's research design was based on real-life situations to depict holistic accounts of particular phenomena meant to help structure future research (Merriam, 2009). Applying qualitative methods enhanced my ability to understand meaning and context, to identify emergent phenomena and influences and, most importantly, to understand the process by which actions and events took place in activities involving members of the individual triads (Maxwell, 2005). This approach allowed me to understand the lived experiences of parents, students and teachers who used the BAIP. The Hoover-Dempsey and Sandler (2005) framework of parent involvement was employed as a frame of reference for structuring the case study.

Guiding Research Questions

This research study examined the experiences and perceptions of teachers, parents, and students in the process of parents engaging with their children in an instructional support role outside of the school. Guiding research questions were stated with the assumption that the study would likely produce emergent questions that were not initially anticipated but meriting careful exploration. The following guiding questions were stated as a strategy in constructing a loosely defined frame of reference for entering the world of the triad members as they began the process of teachers engaging parents in an academic support role. The real-world instructional

environment involved teachers inviting parents to be involved with their children in math activities at home and in a school setting, that were directly related to the classroom instruction provided by the children's teacher.

1. How do teachers, parents, and students experience their respective roles in the implementation of the BAIP model?
2. How do teachers and parents perceive the value of the BAIP instructional model in assisting their students/children in mathematics instruction in school and in non-school settings?
3. How do students perceive the value of parents providing mathematics instruction at home and what is their perception of its value?
4. How does the alignment of resources with standards and classroom instruction affect parent perceptions and use of the resource?
5. How do parents' perceptions of their math competency change as a result of engaging with their children in implementing the BAIP parent resource in mathematics?
6. How do parents, teachers, and students believe the BAIP process relative to the BAIP parent resource can be improved?

Sampling

The inherent demands of these qualitative research methods required that the participating school understood its role in the research and agreed to many accommodations for typical BAIP parent resource utilization. In particular, faculty and administration needed to fully understand the nature of the research, including the procedures, the nature and level of involvement of teachers, parents and students, the potential benefits of the research, and my

engagement in the research process. Consequently, a purposive approach to sampling was used in the selection of the participating school (Tongco, 2007). Purposive sampling is a non-random method of sampling where participants are selected because of particular characteristics for in-depth study. Since participants share particular characteristics, findings may be compared across study participants.

The following five criteria guided the selection of the participating school.

- The school has no prior experience in using the BAIP in teaching mathematics.
- The school administration is supportive in facilitating the engagement of parents as participants in the study.
- The enrollment of the school includes a sufficient number of students with IEPs for learning disabilities to ensure access to students with learning disabilities and their parents.
- The administration suggests or provides private and appropriate space for conducting interviews of students and parents if conducting such activities in the home was inconvenient for the parents.
- The administration permits participating teachers to engage in teaching the BAIP lessons and to participate in training on how to use the BAIP lessons in teaching mathematics. This permission included the teaching of content from the BAIP and allowing teachers to participate in training sessions outside of class time that the school may deem as professional development workshops.

Selection Process.

The following sections detail the process that I used to select and obtain buy-in from the faculty and administrators of the participating school.

Selecting Study School. A small midwestern private school for children with learning disabilities was identified as meeting all of the criteria. The school enrolled not more than 70 students, employed 14 teachers, and was supported by 11 ancillary and office staff. Selection began with contacting the school's Executive Director regarding participation in the study. A member of the school faculty was named as the contact person for this study. I subsequently worked closely with the contact person to obtain a positive response from the Executive Director, subject to a presentation by me to the staff at a regularly scheduled faculty meeting.

The Executive Director was consistently available and supportive throughout the study and written communications were frequently sent between the school and me to ensure understanding on both sides. Their expectation was that their faculty would professionally benefit from participating in research related programs, thus we referred to my presentations as "professional development sessions." We held two professional development sessions prior to initiating any other study activities: Professional development session #1: Faculty buy-in and professional development session #2: BAIP orientation. I conducted each professional development session and coordinated with the Executive Director to ensure the research procedures were integrated with the context presented in these sessions. The faculty held weekly meetings to talk about student progress and educational plans. As enrollment at the school did not exceed 70 and each classroom had no more than nine students, each teacher was familiar with most students in the school.

Professional Development Session #1: Faculty buy-in.

The purpose of this first session was to explain the study and to introduce the BAIP to the faculty. A PowerPoint presentation providing an overview of the BAIP, the rationale for the

study, and a demonstration of the BAIP website was presented. The faculty reflected a high level of interest in the BAIP math and indicated a need for increasing parent engagement during the discussion. One teacher commented that increasing parent involvement at higher level math was challenging, " The kids go home and their parents are like 'I cannot do that'." The school contact person shared with the faculty that math was difficult to instruct and that they lacked a math curriculum and resources. He said, "I just don't have a bunch of text books to give my kids every single day." He also raised an issue about diverse performance in his classroom that resonated with the other faculty, "I have only 9 students but I have first grade math and then I also have 2 students who are in 10th grade math." He noted that he had not worked on 10th grade math since he himself was in school, so the BAIP teacher lessons and scripted dialogs gave him an idea of what to do.

The Executive Director and faculty posed excellent questions pertaining to comparisons with the math program they were using, the background of the BAIP, interactivity of tutorials, how tutorials are scored, and the ease of use of the system. During the demonstration of a BAIP lesson PowerPoint and handouts, one teacher remarked in disbelief, "You can modify them any way you want?" Faculty liked that they could download and edit materials to fit their specific students, which helped them buy-in to the study. Teachers were also interested in what was expected of them, and what students and parents were supposed to do.

The faculty met following this first professional development session and decided to participate in the study. The contact person notified me of their decision. The Executive Director was aware that I would need to interview parents and their children.

Board Member Buy-in.

After the first professional development session, my contact person, advisor, and I met with a board member of the school. This meeting allowed the board member to ask clarifying questions that the administration had and to discuss in detail the nature of parent and student participation. The results of the meeting were very positive, as they advised me on the workings of the school and how to proceed with the selection of teachers, students, and parents, as well as the type of communiqués I needed to prepare for sharing with families.

Selection of triads.

Teachers, students, and parents. With the school selected, my next step was to select individual participants to form six triads. A triad is made up of a teacher, his or her student, and the student's parent. The triad formation began with selection of three teachers, who each would serve as a member of two triads (*Figure 3*). Two students from each teacher's class and their parents were invited to be involved as study participants. Confirmation of participation was important for each triad member. In other words, a student did not become a member of a triad if his or her parent declined to participate, objected to the student participating, or if the student preferred not to participate.

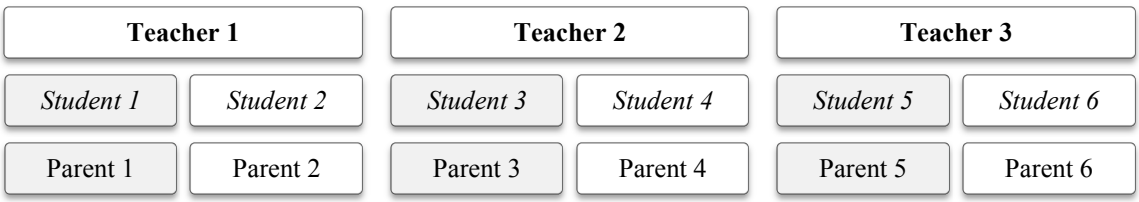

Figure 3: **Formation of six triads**

Teacher Selection.

Following the first professional development session, e-mail discussions were held between the contact person and the Executive Director on potential candidates as teacher

participants. The contact person noted that three teachers indicated an interest in participation. Two teachers taught middle school grades and one teacher taught at the high school level. Each teacher had experience teaching in public and private schools, held a Master's degree in special education, and were experienced in teaching mathematics. Each teacher had students enrolled in their math classes who had an IEP for learning disabilities and were struggling with mathematics on some level (e.g., basic math facts memorization, multiple stepped questions). The three teachers who expressed interest were confirmed as participants after a discussion with the contact person and the Executive Director, and agreed to sign study consent forms at the next faculty meeting.

Student Selection.

Having selected the participating teachers, the conditions were in place for the selection of students and their parents to complete the triads. The criteria for student selection included being enrolled in middle school, having an IEP for learning disabilities, viewed by the teacher as a student who would not be negatively affected by being selected for participation in the study, and with parents who were willing to be involved in the study. Teachers wondered if the definition of the criteria "middle school students" meant being enrolled in middle school or performing at middle school level. I confirmed that the definition encompassed either condition. This meant that high school students performing at grades four through six, or students enrolled in grades four through six, but performing at lower or higher levels could be selected for the study.

Each participating teacher was asked to nominate two students from his or her class to participate in the study. Some teachers were able to list potential students right away and even

recalled parents who had asked the school for suggestions on how they could become more active in their children's schooling.

The contact person coordinated the student nomination process on my behalf. Each student nominee was discussed by the Executive Director and faculty during the next weekly staff meeting, at which I was not present. A total of six students were nominated and contacted for participation through their parents. Confirmation from parents was obtained before the contact person sent the list of names to me. They included four boys and two girls ranging in ages from 11 to 16 years.

Parent Selection.

Because of the small size of the school, teachers and the Executive Director were well acquainted with the nominated students and their parents. With the support of the faculty, the contact person provided me with guidance in the parent contact process. I drafted a letter of invitation for parents, which was then sent to the Executive Director for vetting. Once vetted, the Executive Director sent out the invitational letters to parents, who were then given four days to decide if they wished to participate (Appendix IV). I made no contact with the invited parents until they confirmed their participation with the contact person. All six parents accepted the invitation to participate in the study. The contact person and I worked together to prepare documents detailing next steps of the study (see Appendices V and VI) and shared them with participating teachers and parents. Similar documents were prepared for students but the contact person suggested not using them for fear of overwhelming students. The Executive Director suggested that I made direct contact with parents by phone and/or e-mail from that point forward to address possible new questions as the study progressed.

One family was replaced a week prior to beginning the study by recommendation of the nominating teacher. This change occurred because the teacher had noted that the student was undergoing some behavioral issues, and could be negatively affected by participating in the study. The replacement decision-making process mirrored the initial process and adhered to the same selection criteria.

Participant Orientation.

With the selection process completed, the contact person, Executive Director, and I planned the process for ensuring that both teachers and parents fully understood the procedures involved in the study. The agreed upon strategy involved a second professional development session for teachers and an orientation workshop for parents at which time, the BAIP research model was explained (*Figure 4*). The Executive Director suggested that the second professional development session be open to all teachers and not be limited to just the participating teachers.

Professional Development Session #2: BAIP Orientation.

The second professional development session was scheduled for the second half of a weekly faculty meeting. Each member of the faculty had attended the first professional development session and all expressed further interest in the BAIP and the research study. As such, the Executive Director and all members of the faculty participated in the second professional development session.

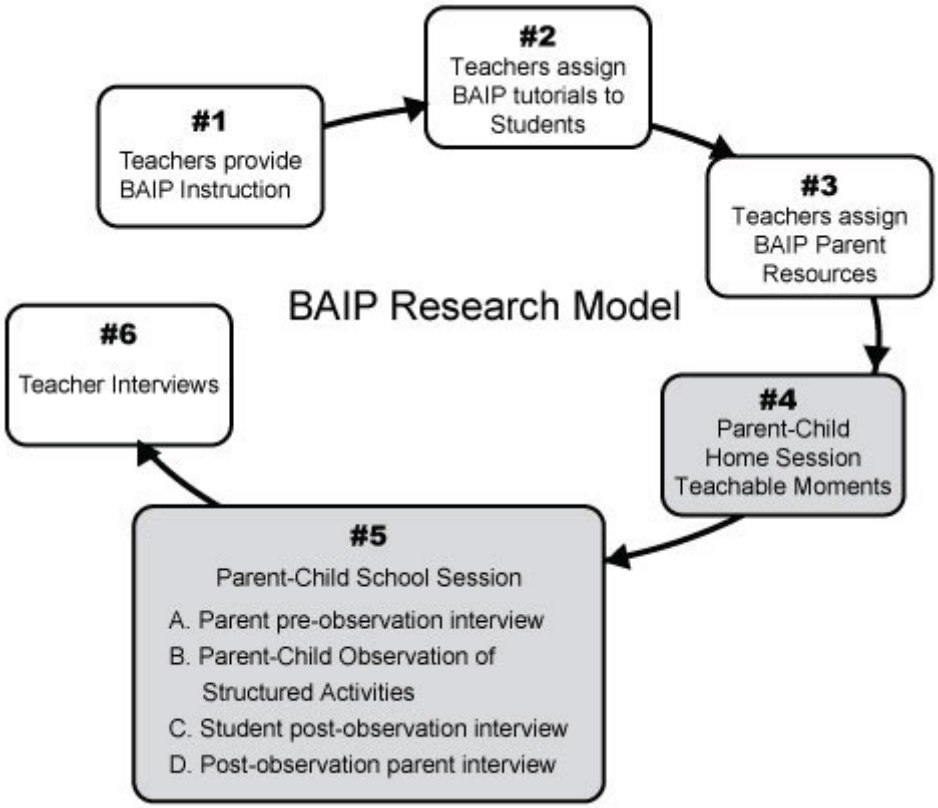

***Figure 4*. BAIP research model**

The second professional development session focused on three key issues: (a) navigating and using the BAIP, (b) level of involvement needed from participants, and (c) clarification of questions. I walked through the BAIP website and demonstrated how to create user accounts, add students, and assign lessons, tutorials and parent activities. Documents detailing next steps of the study were distributed (see Appendices V and VI), and I clarified what teachers, parents, and students who were participating in this study needed to do. This included explaining that teachers had to teach one lesson to each student, engage students in at least one tutorial, and then share the complementary parent activity with parents.

I asked all teachers involved in the professional development session to peruse the catalog of the BAIP lessons on the BAIP website and select ones that would be appropriate for

their students. Each teacher was free to pick different lessons for each student or the same lesson for both their students, depending on the instructional needs of the respective students. After this professional development session, the 3 participating teachers in this study stayed back to discuss study details with me. These discussions led to a decision that two weeks was enough to finalize their selection and e-mail the selected lesson indicator or title to me. All three agreed to teach their selected BAIP lesson after Spring Break (see Appendix VII). This schedule provided them time to familiarize themselves with the BAIP system and the curriculum content.

Following the session, a continuous dialog via e-mail was maintained between the contact person, participating teachers, and me for the purpose of further clarification, problem-solving assistance, and opportunities for me to respond to questions and suggestions. For example, because teachers were testing the BAIP system by setting up student accounts, adding students to classes, assigning lessons and tutorials, I occasionally had to help by resetting the system when they logged in as students and completed the tutorial instead of using the teacher account to preview tutorial questions.

Parent Orientation workshops.

In consideration of parent schedules, the Executive Director suggested holding two parent orientation workshops, one on a Monday or Wednesday and the other on a Tuesday or Thursday. Additionally, the contact person suggested that one session be held in the morning and the other in the afternoon to accommodate parent schedules. The final workshop dates agreed upon with the contact person and Executive Director was a Wednesday morning and a Thursday afternoon. The contact person sent e-mails to parents to update them about student and teacher progress on BAIP lessons and informed them about the workshop dates.

Two parents signed up for the Wednesday session and three signed up for the Thursday session. The contact person informed me that one parent was unable to attend either workshop. I then e-mailed workshop information to this parent (see Appendix VIII). Attempts were made to meet online via Facetime, Skype or Adobe Connect, but those attempts did not pan out. The parent e-mailed to say that a meeting was not necessary as the documents were clear enough. A second parent could not make it to the first workshop and notified the contact person that her spouse would be present for the second workshop in her place. However, she would be the one involved in the provision of instruction.

The parent workshop introduced parents to BAIP, the research study agenda, the roles of parent and student participants, the sequencing of the parent-child home and school sessions, and how to use the BAIP parent site in accessing resources. During the workshop, I helped parents set up their BAIP parent accounts and encouraged parents to ask questions about the study and its procedures. The elements of the BAIP research model were reviewed. First, teachers would teach a lesson, assign students a tutorial, and then share the complementary parent activity with parents. Next, parents would log on to the BAIP parent site to access parent activities prior to parent-child sessions. Each parent activity has two sections, an informal Teachable Moments section and a Structured Activities section. Parents would complete the informal Teachable Moments section before meeting me again, and reserve the Structured Activities section for use during a parent-child observation session. After reviewing these elements, parents selected dates when I could observe them engaging in the Structured Activities with their child in the school. We exchanged contact details so that I could send them reminders a couple of days before our planned meetings.

After the workshops, I sent emails to teachers with (a) an update on the parent meeting, (b) the schedule for parent-child observations planned to begin the following week, and (c) a refresher on how to assign parent activities. By this time, each teacher in the study had already taught the BAIP lesson they had selected for their students and were ready to move on to the next step.

Data Collection Procedures

The BAIP research model (*Figure 4*) is made up of six parts. Teachers start the process by teaching a lesson (Part 1), then assigning the BAIP tutorials to students (Part 2) before sharing Parent activities with parents (Part 3). Parents then complete Teachable Moments at home (Part 4) before engaging in a parent-child school session during which I conduct an observation and several interviews (Part 5). The last part of the model involves teacher interviews (Part 6). Parts 1 through 4 were required to set up the experience for participants so that data could be collected during Parts 5 and 6.

Parts 1-3: Teacher Involvement.

The BAIP research model began with teachers teaching a BAIP lesson then assigning the accompanying tutorial to students. Participating teachers had full access to BAIP lessons, tutorials and the parent resource via BAIP teacher accounts. I encouraged them to familiarize themselves with the system and then use any aspect of the BAIP lesson they desired in offering instruction. Teachers taught their selected lesson(s) after Spring Break, using various instructional configurations (e.g., one-on-one, small group, and whole class instruction). Teachers worked with students on the handouts and online tutorials that accompanied each lesson and then spoke to students about the upcoming parent-child school sessions. When they were close to completing the instruction, teachers shared the complementary parent activity on

the BAIP Parent website; these were the Teachable Moments that they were to teach their children at home, and the Structured Activities that they were to save for the parent-child school session. I emailed parents a week before the day of the observation to remind them that parent activities were available and to complete the Teachable Moments at home prior to meeting me. I encouraged the parents to communicate with the teachers or myself on questions they might have about the parent activity and/or the parent resource.

Part 4: Parent-Child Home Session.

Parents accessed the BAIP Parent website to retrieve the shared parent activity they were to teach at home after teachers had completed their portion of the instruction. I instructed parents during the workshop to engage in the Teachable Moment section of the parent resource activities with their students at home at a time and place convenient to the parent and student, but to do so prior to their scheduled parent-child school session. Parents printed out the activity or worked off the computer for the Teachable Moments. In addition to the parent activity, some parents looked over the other resources on the parent site such as the animated dictionary and tip sheets.

Part 5: Parent-Child School Session.

The six parent-child school sessions took place after-school hours over a two-week period at times convenient to parents and their children. The school made appropriate space available for the parent-child interviews and the engagement of the parent with their child in implementing a BAIP parent activity. All parent-child school sessions were held in the same room, a resource room located in a quiet and private section of the school. A timeframe was set to schedule interviews before and after the observation session with parents and students. This helped parents plan their schedules. Before beginning each parent-child school session, I

informed participants about audio and video recording of the session for transcribing purposes, to aid my memory, and to corroborate notes taken during the session; the recording process would be as unobtrusive. Break times were allowed, as deemed appropriate by the parent and/or student.

A semi-structured interview protocol with basic questions guided each interview (see Appendices IX and X). Supplemental questions with additional emerging prompts and/or questions were included as the interviews progressed. Emergent questions depended on what participants shared during the interview. The intent of these questions was to either build rapport or to enhance engagement in the interview.

Parent Pre-Observation Interview.

I conducted a pre-interview with parents in the school at a scheduled time to collect information on their self-perceived competence as home instructors. The intent of the pre-observation interview with parents was to document how comfortable the parents were with providing instructional assistance for their student at home, their perceived roles, the parents' comfort level in providing home instruction, and to gain an understanding of the dynamics surrounding the students' prior educational experience in mathematics.

I asked participants to read and sign the informed consent statement prior to starting the session. Interviewees signed and dated my copy prior to beginning the interview. The signed statements were retained for the study files, and copies were provided to the participants for their records.

I relied on a prepared script for introductory comments to put the parent at ease. The script was not used as obvious notes, but integrated as dialog with the parents who were well informed on the study. I previously had met with the parents and they each knew the teacher and

Executive Director as well as the school contact person. These prior contacts enhanced the responsiveness of the parents to the pre-observation interview. The pre-observation interviews were scheduled in the late afternoons and were designed to transition into the student joining their parent and myself for implementation of the BAIP parent resources.

Parent-Child Observation of Structured Activities.

Once the student joined us in the study room, I asked the parents to read and sign an assent statement for their children. I also sought verbal consent from students prior to starting the session. The observation session began with casual dialog among the parent, student, and me. I provided a fun activity in which the parent and student engaged to practice thinking aloud and familiarizing themselves to that setting. The fun activities were related to student interests, which were identified by the school contact person at a previous meeting. Upon completion of the fun activity, participants were asked to engage in the BAIP parent structured activity. They could work off a print out of the parent activity or make use of a laptop computer that I provided.

The parent-child observation occurred at the end of the school day immediately following the pre-observation interview with the parent. Students knew in advance that they would be participating in an activity with their parents and that I would be present to audio and video record the sessions. Maxwell (2005, p. 108) reported that the presence of a researcher during an observation may influence participant behavior. However, he also noted that when in their natural setting, participants are less influenced by the presence of the researcher. I made a special effort to minimize the impact of my presence on the responsiveness of the student. I gained participants' confidence through the support of the school, the fact that I had met the

parents, and that I interacted briefly with some of the students at least once prior to the observation. Students in this school were generally familiar with audio and video recordings being made, so they were not all uncomfortable with the research set-up. I also conducted the observations and interviews in a setting familiar to the students, which aided their comfort levels. The setting was not as natural for parents as they have not taught their children math in school prior to this study. However, they visit the school often to pick up their children, volunteer, participate in school-related events, or to attend workshops, and were thus familiar with the school. I was careful to also casually build rapport with the parties before the observation and interviews began. I asked for verbal permission to begin the video recording at the start, and once recording began the parent had full freedom to determine how the activity would be approached.

As the activity progressed, I used a checklist to note particular events and to facilitate recall when transcribing interview notes (see Appendix XI). This checklist was comprised of itemized actions based on expected behavior that parents and/or students may exhibit. Examples are, "Parent read through the activity with student." Or "Student helped parent in navigating through the BAIP site." Items on the checklist were not exhaustive and assumed that research would likely produce emergent behavior that were not initially anticipated but also meriting careful exploration. I noted these emergent behaviors in a written comments section of the checklist. I used verbal prompts during the observation when participants appeared to need a probe to remind them to think aloud. Each observation differed slightly depending on how participants interacted with me. I was sensitive to parents' and students' comfort levels in being observed and recorded, and addressed them as appropriate at the beginning of each session.

Student Post-Observation Interview.

The student interview occurred immediately following the parent instructional activity. Interviewing the student right after the observation aided student recall of the experience. According to the forgetting curve, a "nonlinear function relating the observed probability of memory retention and the delay or lag between study and test" (Averell & Heathcote, 2011, p. 25), the "rate of memory loss for an event is greatest right after the event and then levels off over time" (Magnussen, Melinder, Stridbeck, & Raja, 2009, p. 124).

I asked students to describe their experience of learning at home, and describe their emotions and thought processes when engaged in the activities recommended by the parent activity. Parents could remain in or leave the room during the student interview, at the discretion of the student.

Parent Post-Observation.

I interviewed parents again after the observation and student interview. The focus of this post-observation interview was to document how comfortable parents were with providing instructional assistance for their student at home, their perceived roles, and the parents' comfort level in providing home instruction after having experienced using the BAIP parent resource. I asked parents for their thoughts on the parent resource, the BAIP process, value of having alignment with standards and classroom instruction, how the parent-child school session worked out, whether it met their expectations and how, what they would do differently, what they did not find in the parent resource but would like to have seen in the resource, and how they thought they fared as home instructors. I invited them to discuss their children's reaction to the home instruction, and whether it differed from their prior experiences helping with academic issues (e.g., homework). I also asked them to comment on how the experience affected their role

construction and perceived self-competency levels. Students could remain in or leave the room during the parent interview, at the discretion of the student.

Cross-Check Parent-Child School Session Data.

To cross-check these data and my interpretations, I compared observation and interview records against one another. I also explored triangulation of opinions, perceptions, and experiences about similar issues using data from different members of the triad. Triangulation of observations, nonverbal cues, and researcher memos were used to infer findings. I identified non-verbal cues through an analysis of the video recordings of the interviews. This identification process involved reviewing each of the six observation videos and adding to the transcripts descriptions of behaviors (e.g., facial expressions, body movement, eye contact or lack of, and tone of voice). By doing so, I reduced the risk that conclusions "reflect[ed] systematic biases of a specific source or method" (Maxwell, 2005, p. 93)

Part 6: Teacher Interviews.

I e-mailed teachers during the last week of parent-child school sessions to set up teacher interview sessions. The Executive Director recommended a week that would not conflict with previously scheduled school activities involving the teachers. Preferred dates and times were confirmed with individual teachers via e-mail, and the three interviews took place over a two-week period.

Individual teacher sessions took place in the same resource room as the parent-child school sessions. As was true with the parent-child interviews, the dialog with each teacher was guided by a semi-structured interview protocol. I asked teachers to read the informed consent statement prior to starting the session. The interview started after teachers consented to starting

the audio and video recording. I asked teachers to recount their usage of the BAIP lessons both in and out of the classroom, including perceptions of effectiveness, amount of preparation work, use in class, student reaction, ease of use, communication with parents, and the BAIP process. I also asked them to comment on the BAIP parent resource.

Data Analysis

Analysis of interview and observation data followed a modified version of the inductive constant comparison approach of Glaser and Strauss (1968). Glaser and Strauss described constant comparison as a four-step process of analysis or theory development, of which the first half generally refers to qualitative data processing and the last two relate to theory specification. These steps are:

Step I: Identify units of information; phenomenon or event.

Step II: Isolate a few features of the experience or phenomenon that are of interest to create collections of code, or concepts of similar content.

Step III: Create families of code through grouping similar concepts. Decisions made at this point are based on initial and emergent findings without further collection of new data.

Step IV: Select subsequent study groups based on prior findings to further develop theory.

Because the present study was not concerned with developing theory, I used only the first three steps for analysis. Data processing steps for this study, thus, included (a) unitizing, (b) categorizing, (c) conducting member checks, and (d) filling in patterns (Guba & Lincoln, 1985), after which a (e) report could be constructed organized by main themes. I started analysis based on the guided questions and then fine-tuned the analysis by reporting it based on main themes.

Unitizing.

This step identified and recorded essential information units. Each unit was defined as a stand-alone piece of information that may be a single sentence or a paragraph of transcribed text. Each sentence in the interview transcript was read through one sentence at a time. I decided if the information contained in the sentence was relevant to a research question. If it was, I coded it with key words using Atlas.ti, qualitative analysis software. Each piece of information was also automatically coded within the software with attributes that helped trace it back to raw observation or interview notes. Examples include the primary document number and code number. Other attributes included interviewee information, date of observation and interview, transcript page, and paragraph and line numbers (Skrtic, 1985; Skrtic, Guba, & Knowlton, 1985). Two cycles of coding (Saldaña, 2009) took place. First Cycle coding happened during the initial coding of data, and utilized "values coding," "versus coding," and "evaluation coding" of participant quotes in an iterative manner.

Values coding.

Values coding is the application of codes onto participants' quotes that reflect certain values, attitudes, and beliefs regarding specific topics. It encompasses four types of subcodes: values, attitude, belief, and data. For example, when asked "Which part of the activity did you like the most and why did you like it?" he responded with, "When we were done, because I don't have to... do it anymore." This was coded as "Activity Burden/Chore" as the student deemed participating in the activity as important enough to sit through the exercise grudgingly. The student believed the activity was necessary but did not enjoy the experience. Value codes focused on the importance that participants attribute to PI, math in school, and math in the real-world. Attitude codes looked at how participants felt about their involvement, their penchant or

dislike for math, and how they felt about the BAIP system. Belief codes are embedded in participants' values, and data include who is most responsible for students' success in math and the effort that parents should and can put in to students' home instruction.

Versus coding.

Versus coding is the application of codes that identify groups or ideas that appear to be in direct conflict with each other. The key versus code used in the study was expectations of the school, in particular, public versus private schools. A second versus code was expectations of the home, especially when it was school versus home responsibility.

Evaluation coding.

Evaluation coding here is the application of codes that assign opinions about the advantages and disadvantages of the BAIP parent resource. Evaluation codes form a collage of information about the components, characteristics, and expectations and outcomes of the program experience to make decisions about program design, improvements and effectiveness. Evaluation codes included liking or disliking components of BAIP, enjoyment, and feedback from participants. These codes provided information on which to base recommendations for change.

Categorizing.

The Second Cycle of coding involved classifying, prioritizing, integrating, synthesizing, and conceptualizing data. Saldaña (2009) noted that second cycle coding methods are "advanced ways of reorganizing and reanalyzing data coded through First Cycle methods" (p. 149). This categorizing process was ongoing and used inductive methods to collate units of data with similar content into "a loose taxonomy" (Skrtic, 1985, p. 195). The purpose of categorizing was

to discover a set of categories or themes that would handle the units of data effectively, allowing external auditors to agree to the logic of the category system. Categories changed as more data from subsequent observations and interviews were added.

Member Checks.

While analyzing notes on initial interviews, I was sensitive to identifying gaps in information that needed to be filled by adding relevant questions to the interview protocols of future interviewees, and through follow-up with participants that had already been interviewed. This gap identification was achieved by applying the practices of credibility, transferability and dependability and confirmability.

Filling in Patterns and Building Themes.

Saldaña (2009) described themes as outcomes of "coding, categorization, and analytic reflection" (p. 139) and theming data as "more applicable to interviews and participant-generated documents and artifacts, rather than researcher-generated field notes" (p. 141). Across interviewees, I looked for recurring patterns or concepts that were consistent with, or drastically different from the literature on parent involvement (e.g., Epstein, 1998; Hoover-Dempsey & Sander, 1995). I paid attention to themes and feedback about member roles that were expected versus those which occurred, perceived value of the parent instructional resources in mathematics, benefit of alignment to standards and classroom instruction, parent self-perceived competency, and feedback for improving the BAIP process and parent resources. Once observation and interview data were unitized, categorized, and organized into a qualitative data management system, I responded to the six guiding research questions before looking for themes

and patterns across triads, as well as across roles (parents, teachers, and students) regarding experiences and perceptions. I incorporated this information in to a report structured by main themes.

Report Construction.

Based on the collected data, I drafted a preliminary yet detailed overall response organized by the guiding and emergent questions. Each question had several themes and patterns, and within those themes, topics like role of member, perceived value of the resource, self-competency, whether alignment matters, and areas of strength and need for improvement are addressed. The multiple purposes of this step were: first, to find out how users generally acted in their roles; second, to identify valued functions of the resource; third, determine how parents' self-competency levels changed; fourth, whether alignment of resources to standards made a difference; and last, what was working and what was viewed as needing to be changed. In each research question, themes and patterns identified in the data were used to explicate the participants' respective experiences and formed the foundation of the draft report evolving from this research. After completing the detailed responses, main themes that spanned all the guiding questions were identified. The final report was structured by the main themes of the study.

Validity and Trustworthiness

This study was built on available data that was gathered via interviews and observations, and therefore may have some gaps. To fill these gaps to the extent possible, I conducted member checks or follow-up conversations with participants that not only built credibility of the data but also improved the transferability of results. I took care to control for validity threats such as researcher bias, reactivity, and reflexivity. Maxwell took the stand that validity is not about

getting to an objective truth, but "the possibility of testing these accounts against the world, giving the phenomena that we are trying to understand the chance to prove us wrong" (Maxwell, 2005, p. 106).

Validity Threats.

To control for threats to validity, I addressed three main concerns raised by Maxwell (2005): (a) researcher bias, the effect of my preconceptions; (b) reactivity, the effect of the study setting on the participant and (c) reflexivity, the effect of the researcher on participants during the study.

My personal biases or subjectivity about the intervention as well as preconceptions about results or theory may lean towards proving that the BAIP was useful in increasing parent involvement. To counter this tendency, I made every effort to share all positive as well as negative data in the report. My findings in Chapter 4 present not only the positive statements supporting the BAIP, but the contradictory or negative ones that teachers, parents, and/or students shared.

Reactivity, the effect of the study setting on the participant, may have occurred. To minimize discomfort for participants, I conducted interviews in the school where they felt safe and comfortable. The presence and support of school personnel on-site added credibility to the study. Use of a video camera to record the parent-child school sessions would have been more of a concern had not the contact person said that it was a common practice at the school and students would not be too uncomfortable with it. Each parent-child school session started with a fun activity that helped to orientate parent and child to the new surroundings and to the notion that parents are providing instruction or academic support in school. In addition, students had

their parent present whenever the camera was recording, and sessions lasted long enough for students to get used to its presence in the room.

Reflexivity, the effect of the interviewer on participants, was a huge validity threat. The possibility exists that participants were not entirely honest about their experiences because I was one of the people who worked on the BAIP. However, I encouraged participants multiple times to give me feedback, negative or positive, as the intention of the study was to better understand how to improve the process. To build a relationship upon which participants would feel comfortable enough to share their thoughts, I interacted with teachers face-to-face and over e-mail as often as I could to let them get to know me and feel comfortable sharing their honest thoughts. I met parents during a prior workshop and spent time getting to know them then as well as on the day of the interview. I spoke to students with their parents present so they would not feel intimidated by a stranger. It was my hope that it would increase familiarity and reduce the pressure on them to provide socially acceptable answers to my questions. During interviews, I also tried not to ask leading questions, to keep questions open-ended and objective. I also made it clear that my objective was only to find out more about the intervention and how it is used, and that I did not have other agendas. This approach helped parents understand that I entered the study as a neutral party and was not privy to school information, nor did I have agendas that would negatively impact them, their standing with the school, or their children's grades at school.

Validity Checks and Establishing Credibility.

Intensive interviews were conducted to collect rich data that provided a detailed picture of what was experienced. I prepared verbatim transcripts of the interviews and added non-verbal descriptions to the documents to provide a more holistic picture. In an effort to establish

credibility, I triangulated data from participants and conducted respondent validation or member checks or at multiple levels (Skrtic, 1985, p. 200). Triangulation of data happened when data from more than one participant was gathered about a topic, regardless of whether it was positive or negative. At the end of interviews, I summarized notes and verbally presented them to the participants as first-level member checks. I then transcribed each interview and sent the text to individual interviewees for a second-level member check. At each level, interviewees corrected me and/or provided further information where necessary to be certain that their intentions were not misunderstood.

An extra step was carried out by an objective auditor, my committee member, Dr. Ed Meyen (Guba & Lincoln, 1985). Dr. Meyen read all the verbatim transcripts and was privy to a blog that I kept on study process in chronological order. He was able to determine whether the study was executed in an acceptably professional manner, assess the neutrality of the inquiry, and evaluate whether my interpretations were grounded in the actual raw data (Skrtic, 1985).

Generalization and Transferability.

This research provided an in-depth study on a small group of users who experienced the BAIP parent resource and its part in the BAIP instructional process. The goal was to understand how the BAIP was being implemented with particular attention given to the parent-child engagement function. External generalizability was not a goal of the study because I purposively selected the ideal type of participants. Findings contribute to knowledge about PI for currently involved parents with interest in ways to more easily support their children's math learning. An additional outcome was to determine ways to improve the BAIP parent resource such that it encourages parent involvement in instruction at home.

Qualitative methods were employed to enhance understanding and the results cannot be generalized beyond parties very similar to study participants. To aid transferability from the present context to potential receiving contexts, my task was "to be diligent in describing the sending context" (Skrtic, 1985, p. 200). I used purposive sampling and thick descriptions, in the form of the report, to advance transferability to a specific population. The level of detail was necessary to "allow persons at the receiving context [to] judge whether findings from the sending context are applicable in their case" (Skrtic, 1985, p. 200). To facilitate this judgment, I used as many quotes as possible to tell the story in the words of participants in the final report.

Chapter 4: Findings

Overview

Six triads of parents, teachers and students were asked to engage in BAIP math resources. Teachers, students, and parents had no previous experience with BAIP other than what was shared during workshops conducted by me. Prior to using the BAIP resources, teachers were walked through the program, and parents and students received initial informational letters followed by manuals and documents with steps detailing what they should be doing after providing consent (Appendix I and II).

The intervention followed this sequence: teacher taught a BAIP lesson, worked with his/her students to complete the accompanying handout and tutorial, and then gave parents access to the complementary parent activity. Teachers selected lessons that were suitable for their students (see Appendix VII). Lesson topics included were (a) adding, subtracting and multiplying mixed fractions, (b) multiplication and division facts, (c) greatest common factor and least common multiples, and (d) ratio, of which the latter two were assigned to two students instead of one. All observations and interviews were conducted in a classroom allocated by the private school and were audio and video recorded. Parents engaged in informal learning activities with his/her child at home prior to the interview and then engaged in structured learning activities on the day of the interview. Parents and students were observed engaging in the structured portion of the parent activity. All parties were interviewed. Data was collected and responses were written for the guiding research questions. I found that the responses to the questions had some overlap which indicated that a thematic structure would be better suited for presenting findings. So instead of presenting responses to six research questions, chapter 4 is structured by major themes. The main themes describe how (a) parents and teachers perceive

parent involvement (PI) differently, how that results in (b) different requirements of parent resources, and that (c) BAIP is a functional parent engagement model. The findings suggest an emergent partnership for learning at home that requires synchronization of teacher and parent perceptions of PI.

Sample Population

Parents

Three fathers and three mothers originally agreed to take part in the study. After the workshop, one father asked his wife to participate in his place. Final participants included two fathers and four mothers. All parents in the study are of Caucasian ethnicity, within the age range of 36 to 55. Annual household incomes ranged from 70,000 to 300,000, although the parent that reported the 70,000 mentioned that it may be a little high. Parents who took part in the study had basic degrees, masters, or doctorates. Their spouses had high school diplomas, bachelor degrees or doctorates. Self-rated comfort level in teaching someone else math ranged from not comfortable to very comfortable.

Teachers

All three teachers in the study each have a Masters in Special Education and experience teaching in both public and private schools spanning 12 to 36 years. The three teachers were observed as having different levels of comfort teaching math, one having published a math textbook, one teaching high school math, and the third specializing in reading.

Students

Six boys and two girls, ranging in age from 11 to 16, participated in the study, all of whom have Individualized Education Plans (IEP). Two students are on the autism spectrum but

are high-functioning, the rest have varying difficulty with reading and writing because of dyslexia and auditory processing deficits. Four of the six are introverted and displayed varying levels of math ability. Four were in middle school and functioning at or below fifth grade in Mathematics and the remaining two were in high school and functioning at middle school level Mathematics.

The Triads

Triads 1 and 2

Mr. Mark (Teacher)

Mr. Mark is a veteran math teacher with more than 30 years of teaching experience in math and special education. He has an extensive knowledge and in-depth understanding of math and has published math resources. He teaches middle school students. Mr. Mark selected Trent and Miles to take part in the study to test how beneficial the BAIP resource might be for users. Trent has dyslexia and Miles has Asperger's syndrome and neither of them have major difficulties in math.

Trent (Son) and Tanya (Mother)

Tanya and Trent is a mother-son pair who teases each other jovially. Tanya is an online instructor by trade and helps Trent, her second child, with his homework. Both Trent and Tanya shared that Trent works better with his mother on math homework than with his father. Trent's father does not get involved too much as "Generally, you know, it rises to a conflict." Tanya explains that Trent and his father have "a totally different way of looking at things. " She said that her husband "sees it in his head. He can't transfer that to Trent so I do as much visual as I can." Trent has commented, "Mom, you totally get how I'm thinking!" Even though Tanya and

Trent work better together, they have their fair share of fusses and fights. Trent enjoys playing tricks on his mom when they work together.

Miles (Son) and Marissa (Mother)

Marissa and Miles is a mother-son pair who demonstrates a fondness for structure and big words in their regular conversation. Marissa used to work but is now a stay-at-home mom who had to home-school her two children for a year when her husband was deciding on where to move to for his job. Miles is her first born, has Asperger's, sticks to rules and routines, and is an excellent student. Marissa rarely has to help him with homework extensively. Marissa explains that help for Miles isn't necessarily "help me" with homework. It's more a call to "be a physical body in the same room... to keep [his] anxiety levels down."

Triads 3 and 4

Mrs. Chelsea (Teacher)

Mrs. Chelsea is an experienced special education teacher with a forte in language arts and has more than 20 years of experience in both public and private schools. She teaches middle school and selected Amber and Gwen as they both needed math refreshers. Mrs. Chelsea thought providing their parents with a parent math tool would be helpful for them. Amber is on the autism spectrum but does not have much difficulty with math. She is however, described as "lazy" by both Mrs. Chelsea and her mother. Gwen has poor reading and writing skills and she has not committed math facts to memory. She is slowed down by relying on speed counting.

Amber (Daughter) and Angela (Mother)

Angela and Amber is a mother-daughter pair who was openly affectionate with one another. Angela is a working mother and rarely tutors Amber, her second child, in math. Angela

leaves the tutoring to hired tutors, her son, whom she describes as "a golden child," or to her husband. Angela shared that her husband "has the rapport with Amber, the two of them connect. Whereas my son and I connect. So I will always help my son with his homework. When it comes to Amber, he has a way of getting her to do what needs to be done. So he does a lot of that with her." However, Amber will turn to her mother for assistance when other resources are unavailable.

Gwen (Daughter), Gordon (Father)

Gordon and Gwen is a father-daughter pair with an interesting dynamic as Gordon kids with Gwen until she chides him. Gwen in turn, sneaks errors into her answers and catches Gordon for not spotting them. Gordon is a working father who has a good working relationship with Gwen even though he says "I really don't understand her at all but... we get along better than anybody." Gwen's mother works long hours and is not home enough to work on math activities with her. Gordon home schools his older son and helps Gwen with homework only when she asks for help.

Triads 5 and 6

Mrs. Joyce (Teacher)

Mrs. Joyce is an expert teacher in special education with more than 12 years' experience in both private and public institutions. She teaches both middle and high school and selected Jason and Craig from her high school class to participate in the study as both students were missing some basic concepts needed for understanding greatest common factor and least common multiples. Jason does not have much problem with math but is slowed down by reading. Craig has auditory processing deficits and takes longer to process words and text.

Jason (Son) and Julia (Mother)

Julia and Jason is a mother-son pair who was quieter as compared to the other parent-child pairs. Julia rarely helps Jason with his high school homework due to a negative experience in the third grade. Julia will bring him to school earlier to seek help from his teachers especially if neither his father nor younger brother, who is in public school, is able to help since "the teaching is so different from public school to private school." Julia's "husband actually was better in [math], all the way up to calculus but it is different than what Jason's learning now."

Craig (Son) and Colin (Father)

Colin and Craig is a father-son pair who was soft-spoken throughout the parent-child school session. Colin helps Craig, his second son, with his homework frequently. Colin sold his business several years ago but came out of retirement and returned to the workforce as a teacher to add to his children's education fund. Both Craig's parents are highly involved in home assistance and instruction and have split the subjects between them depending on their fortes. Craig "missed out a lot in his very early years" while his parents struggled to figure out why he had such a challenging time at school. They "finally found out that he did have a learning disability [but] he [had already] lost like three or four years there." Craig is "very private about his disability" and seems to only readily seek help from his family.

Main Themes

The data collected during the study allowed for analysis from many perspectives. I took the perspective of evaluating the BAIP model against a framework of parent motivations and found BAIP to be supportive of parent involvement. In addition, data suggested that the BAIP model could facilitate the structure for home-school partnership, which involved simplifying

representations of real-world phenomena (Powell, 2006) and comparing them to Swap's framework (Swap, 1993). Three key findings that built on the theoretical frameworks (Epstein, 1987; Hoover-Dempsey et al., 2005; Swap, 1993) and lent to the emergence and maturation of a partnership model are discussed below. They are (a) parents and teachers conceptualize parent involvement (PI) differently, (b) parents and teachers have different needs of and experiences with parent resources, and (c) BAIP was a Functional Parent Engagement Model.

Theme1 : Parents and Teachers Perceive Parent Involvement (PI) Differently

Participants believed that responsibility for student success is shared by all members. Both parents and teachers noted that each party would do what is within their means to help the student learn math. This could be interpreted as motivation to participate and therefore success in PI programs. However, through the study, I realized that simply facilitating the recommended processes in Hoover-Dempsey and Sandler's (Hoover-Dempsey et al., 2005) framework would not be enough to ensure long term success in PI programs. A much broader perspective is needed and the BAIP supports and encourages key components such as learning at home through empowering parents and utilizing parents' intellectual resources and funds of knowledge. Participants experienced the program supporting learning at home and received content and affective support through parent activities. Data indicated a gap in the understanding between teachers and parents, and within the parent group, of what supporting learning at home meant. Parents perceived a need to be involved but that involvement was not valued. Teachers valued PI but did not see as great a need for parents to be involved in academic support. Teachers preferred parents to be more involved in school-based events that focused less on instruction. This meant that PI was understood differently. Since a common understanding of learning at home was

lacking in both parents and teachers, and attitudes towards PI tended towards a deficit or curriculum enrichment model, the resulting expectations of the teacher-parent or home-school partnership was equally disparate. The following section discusses how parents and teachers conceptualized PI, and how they differed in perceptions.

Sub-Theme 1.1: School Experiences Contributing to Parents' Conceptualization of PI

Parents bring with them prior knowledge and notions of school, childhood, and life. Their past experiences affect what they expect of schools, how they assist their children in homework, and how they expect to be involved in their child's school and academic experience. Parents may have enrolled their children in different public schools, come from different educational backgrounds and SES, but they shared several things in common. They all had children with disabilities, most of whom experienced negative public schooling. Some of the parents had negative experiences of their own when they were in school. All of the parents had increased expectations of the private school, and showed clear readiness as parents to be responsive to their children's needs and willingness to work with the school.

Home-School Responsibility and Partnership Needs Not Met

Home-School responsibility refers to what one party expects of the other in terms of taking responsibility for student learning. This expectation, when balanced on both sides, becomes an understanding that influences parent role construction and context. Hoover-Dempsey and Sandler (2005) define parental role construction as "a sense of personal or shared responsibility for the child's educational outcomes and concurrent beliefs about whether one should be engaged in supporting the child's learning and school success. (p. 107)" Parent role construction is a social construct influenced by how the home and school partners to help

students succeed; and molded by parents' prior experience and beliefs. Context refers to the type of school that students are enrolled in i.e., public or private. Home-school partnership is often a vague relationship in the parent's mind which leads to less than optimal student support. Clarifying the responsibility of a partnership requires members to be clear on what their roles entail, and what is expected of the other party. Parental role construction affects the balance of the partnership and if roles are not clearly defined, the partnership suffers from ambiguity. Though not measured, context appears to act as a mediator in expectations of responsibility taken on by the school.

Some parents in this study said the bulk of the responsibility of supporting students belonged to the school or the teacher, some said it was a shared responsibility between home and school, and others said it belonged to the student. Only one mother, Marissa, said it was primarily the parent's responsibility, and she did so with the caveat that it was only when she was homeschooling; otherwise, it was the teacher's responsibility to guide the student to success. Other parents also had high expectations of the school. Tanya, Trent's mother, expected a private school to do a lot more than a public school in teaching students with learning disabilities and formal learning. Trent used to attend a private school, then a public school, then the private school at which the study took place. Tanya and her husband have always been involved in Trent's education, especially when he was in a public school. Tanya believed that the school is responsible for formal learning and that the "home should just be a review of what he did during school." She expected more expensive, private schools to deal better with Trent's learning disabilities than the home. She felt that parental responsibility increases when the student attends public school, is behind in grade level math, has a desire to learn something that is not addressed in school, or has a parent who is able to provide home math instruction.

Trent's mother viewed the responsibility partnership in percentages and noted that the level of PI depends on students' math performance. The more help the student needs, the more involved parents will be. Tanya used "flash cards and work books" that she purchased from the book department at the Dollar Tree when Trent was in Kindergarten and first grade. When Trent went on to elementary and middle school, she helped him with his homework and "[took] whatever his paper [was] and change[d] numbers around. You know, so it's not the exact problem, but it's similar." For instance, if Trent completed his homework incorrectly, Tanya would "make up totally new problems" if she thought that he needed more practice.

> I don't think [the responsibility partnership between school and home] should be 50-50. I think... the demand is. It has to be if your kid's gonna... do well. Then the parents have to take responsibility to advocate for their kids one way or the other. And so here, we pay for that to happen so I guess we are taking responsibility you know by paying the tuition and sending him somewhere where we know for sure he's going to be taught the way he can learn. (Tanya)

Tanya had higher expectations of private schools as she "hold[s] them to a higher standard" as compared to public schools. That's why Trent was enrolled in a private school so that they could help him do better in school and equip him with learning strategies.

> Because he needs that special... um... teaching ability? So as far as a place like [this private school], I hold them to a really high, very high standard. I do expect them to send home homework but more about... that would be more about the... the practice of doing homework as opposed to go home and learn something. (Tanya)

Since Tanya was paying a premium for the private school, she considered the school responsible for Trent's success in math and willingly reduced the amount of PI.

> I wouldn't want it to go oh well 30-70. Now, I still want the [private] school doing as much as they're doing and we're adding on to it instead of taking away some. “Oh they didn't get that done in school, well let's do it at home.” I don't look for that kind of scenario. (Tanya)

Tanya thinks of what the school does as the minimum provision of support, and anything that they do at home as adding to it. This means that Trent gets more help from all parties and not a set amount of help distributed between home and school. Tanya used to make Trent redo every answer he got wrong on his homework. This habit of redoing math problems stemmed from her own positive experience in seventh grade when she was taking algebra. She would “sit together at lunch [with her friend] because... algebra was right after lunch, and [they] would compare all [their] homework answers. And if any of [their] answers didn't match, [they] would both redo those problems.” The practice of reworking wrong answers stopped when Trent attended private school as they made him do that there. However, she sees them going back to that practice once Trent transitions to public school again. In fact, Tanya “knew they were going to have to be on top of it” and expected to be more involved in partnering with the public school to provide Trent with as much support as possible.

> I wish the [public] school was able to be on top of it all the time but I know that we will definitely need to partner with them for Trent to be successful. (Tanya)

Once Trent transitions to public school, Tanya’s expectation of the responsibility partnership becomes “maybe 50-50 in public school scenarios.” Parents wanted public schools to do as much as private schools but it was not that way in reality. Tanya lamented that “I don't want it to be that way. I wish they would elevate themselves to a higher standard. Like maybe

they used to? But I don't expect that now because it doesn't happen now." The partnership between home and school is dynamic and such experiences help parents conceptualize PI.

Home-School Support Insufficient

Most of the parents had negative experiences with public schools, affecting certain expectations of the school-home relationship, which led them to enrolling their children in the private school. The following story describes a family's negative schooling experience in a public school, the parent's reflection of his own schooling experience, how he was involved in learning at home, and how the family eventually went to the private school.

Instructional experience for SWD was rarely coordinated so that the student would receive consistent instruction. Gordon and his wife were very involved in Gwen's education and were her advocates when she was in public school. The public school that she attended could not address her learning needs and she fell behind in her work. As a result, Gwen has never liked school; in fact she "hadn't liked school since she was in kindergarten." Gordon recalled that Gwen felt she was being treated differently at the public school and she tried very hard to blend in, "I know she, when she was in the other school, she always carried around books. You know, she couldn't read them, but she'd act like she's reading them. But she uh, she couldn't. And uh, I think, think the math's about the same way. She knows she needs it but... she's still not that good at it." Gwen got so far behind her peers that even with her parents' help, she still could not keep up with homework. Even though Gordon said he was comfortable teaching her math, he could not understand why Gwen did not understand certain concepts and it frustrated him so much that they "butted heads a lot."

> Before she went in [private school], we just got to where she didn't have any homework because we didn't get nothing done. Everything was so hard and I mean she was in uh... Whatever grade she was and they were pushing what they were trying to study. And she was just so far behind them, she didn't understand it! So I mean, we got to where we. They sent home homework and we wouldn't do it. Just because it's far too advanced. It's like teaching something brand new every day. And so we stopped doing homework and eventually they stopped sending it home. Because we didn't, Couldn't get it done. Because, can't teach somebody something brand new every day. You're supposed to know some of it. Yeah, so we just got to the point where we didn't do the homework. (Gordon)

Gordon himself faced challenges when he was in school himself. Mrs. Chelsea said Gwen's parents shared stories with her that they "[weren't] particularly successful in school" and she believed that Gordon "probably has a learning disability" based on past occasions of home-school communication. Gordon admits to thinking he had "a little dyslexia or something" that made math a struggle for him. Gordon and his wife felt that they could not provide the specialized help that Gwen needed because of the different math education they received and her learning needs. The couple had a consultant who told them that "it's not [their] job to carry the [public] school along. They have to be able to pick up the burden and fix stuff." Gordon and his wife sent requests to the school to provide Gwen with more help but had quite a few setbacks dealing with administration. They were often on the receiving end of "oh no, we can't do that," and it was the same case when Gordon and his wife asked for more time with the special education teacher for Gwen. Gordon said they "[did] a lot of pushing, a lot of hollering" and

about four months later, the school responded with 'we can do that after all.'" Even then, Gwen was lagging behind her peers so Gordon hired a tutor to take over home instruction.

> I don't know, I'm her parent and we just didn't clique too much when she was like that, and we got in lots of arguments. Or she just shut down a lot because I... I try to shove it down her throat and she didn't like that. (laugh) Uh huh, so yeah, we got the tutor because uh we're decent parents but we suck as teachers when they're like that. So we gave up and got a tutor. (Gordon)

Engaging the tutor did not bring about the success Gordon had expected. The lack of curriculum alignment, i.e., consistency in instruction at home and in school, confused Gwen and her grades deteriorated. Gordon tried to get Gwen's school to cooperate with their tutor to address her learning needs but the arrangement could not be sustained.

> So... yeah, everybody was on different levels and we fought that all the time. We had one teacher that, when it was third grade, let our tutor pretty much plan everything. I mean she told the teacher what to teach and that year she did pretty good. But then it went back to the way it was where everybody weren't on the same page and Gwen was with them. She took a nose dive that year. She went from like third grade to first grade level that year. (Gordon)

The lack of coordination in instruction between the home and the school was mitigated by positive private school practices that addressed the individual student's learning needs. Gordon sent Gwen to summer school at the private school where she "like[d] school again" and the experience "turned her around. She cried when she found out she was going to come to school over here. And within the first month, she loved it. Yeah, she said, 'I don't want to go back to that other school, dad.'" Gwen enjoyed her time at the private school so much that she

does not miss a day, and would insist on going to school even when she was sick. The private school fulfilled Gordon's expectations of what a school should do without parents having to keep pushing for accommodations for a student with learning needs. Gwen's teacher at the private school understood Gwen's learning needs and strengths and helped to build her self-confidence. According to Gwen's private school teacher, Mrs. Chelsea, Gwen is the "poster girl for students with learning disabilities," but "math for Gwen, is a particular strength" and it was the reading that held her back. Having teachers who understood her has made it easier on Gwen and her parents.

Gordon saw the success the school and Mrs. Chelsea had with Gwen and believed that the private school provided a lot more support than the public school. Mrs. Chelsea liked the idea of "having the child and parent work together" so that the "parent then knows what their kid is really doing in math." Gordon will only step in to help Gwen if asked to, especially since "[he] wouldn't know if she needed help or not unless she asked." He reiterated the belief that the way Gwen was taught math was very different from his own education.

> Well it's, I think it's all the school's job until they ask for help. I mean, I'm more than willing to help with anything they ask for. But as long as they don't, as long as they don't ask too much at least, I don't normally don't help. 'Cause I figure, you know, they teach different now anyway. (Gordon)

Now that Gwen was in a good private school, Gordon and his wife were no longer as involved in school matters. The public school provided adequate support and was responsible for Gwen's learning. Mrs. Chelsea noted that "Enrollment in the private school was an excellent decision for Gwen" as achievement testing with Mrs. Chelsea showed that Gwen "went up numerous points." Mrs. Chelsea attributed the improvement to how Gwen's "confidence has

improved, and she has better understanding, and time is spent on it." This improvement was possible because of the private school's supportive learning environment where they "don't go at a (four quick claps) pace you know, kind of thing."

The negative experiences with the public school led to Gordon and his wife being advocates for Gwen, fighting for accommodations to help her learn. If they had not transferred Gwen to the private school, they would have continued their extensive involvement in advocating for her educational rights. In contrast, the positive experience with the private school led to Gordon adopting a different approach to PI where he spent less of his efforts on trying to get her accommodations, and more time supporting what the school does. At the private school, Gwen is taught to be her own advocate and to seek out assistance. Gordon no longer gets involved unless asked to do so by the school or by Gwen. Many parents in the study were like Gordon, waiting for invitations to spur them to act beyond what they currently do.

Parent-Teacher Communication Breakdowns

Parent-Teacher meetings happen too infrequently for parents to be able to provide timely help for struggling learners. Julia said that the teachers at the public school "always encouraged [parents] to ask [questions] but when they actually got back to you" it was after the parent "scheduled a parent meeting or something." Even sending teachers e-mails or notes about children needing help with the day's homework may not get them timely help. Sometimes parents faced teachers who were "not responding in time" and this caused students to get in trouble at school for incomplete homework.

Julia described a situation where "the homework is due the next day [but] then it's not done." She said, "The kids' getting in trouble at school because they didn't get their homework done and then you know the emails being sent from us, the parents." Teachers may then "get

back to [parents] later on that night or the next day" or "even a day later than that." However, the help is late and in Julia's experience, teachers often say, "okay well we've moved on to something else. Let's, you know. He just didn't get it." This breakdown in communication and in parents' past experience was "not helpful at all." Parents firmly believed that "math is figured out in steps" and missing out on any step would cause "some serious disconnect." By then, "the subject or the problem was already two weeks old and they had already moved on to something else." Having the resource, especially the BAIP Structured Activities, would allow parents to help students complete homework and avoid negative schooling experiences where the student is "[swept] under the rug." In Julia's words "the lack of immediate response in public school really dampered" students' progress.

Colin felt that Craig's previous school did not provide adequate support and "was just… terrible." Craig faces challenges with auditory processing but his teachers were not sensitive to his learning needs. Colin said, "Sometimes you'll talk to him and he'll look right at you and you think he didn't hear you but he's actually trying to process it." Some of Craig's public school teachers "picked it up as being defiant" when he did not respond. Craig was in fact just "trying to process what they were saying." Not only were the public school teachers not ready to support SWD like Craig, they also did not support or facilitate home-school communications. Colin shared that he was not computer savvy and therefore would prefer to speak to Craig's teachers over the phone. He lamented, "You would call them and call them and call them and they would never call you back." At one point, he called a teacher three times in one morning at half past seven but could not get a hold of anyone. He took a step out of his comfort zone and sent a quick e-mail. He said, "[I] sent the e-mail and I bet I didn't even hardly hit the send button, I got an email back." Reflecting upon the speed with which the teacher responded, Colin surmised that

she must have been “setting right there, by her desk” which got him pondering, “mmm, you don’t answer calls but you’ll answer e-mails.”

All parents made attempts to reach out to their child’s teacher or school as they felt it was necessary to advocate for them or to get needed advice or help for completing homework. Parents thus felt that involvement was necessary. Part of the perception also acknowledged that this type of involvement was not always valued by teachers and schools, especially public schools.

School/Teacher Invitations to Be Involved Understood Differently

A difference in understanding is also observed in how parents and teachers recognize invitations to be involved. Marissa used to send Miles to math club meet-ups at a previous school and parents were asked to “take turns sending in donuts. But it was never the content of the math club.” In fact, she “had no idea what was going on there.” Mrs. Joyce perceived that homework was a parent’s “way to get involved in the learning.” The call to help must not have been obvious as parents said they did not receive invitations to get involved in the instruction or learning directly.

When asked to recall school invitations to get involved in Amber’s math education, Angela said, “Um, no. I don't, I don't recall anything like that.” I redefined the question and asked if the school ever sent work home that said “please sit down with Amber and work on this together?” Angela then said yes, there were invitations if that was the definition but “it’s all blurred together” and she couldn’t remember specific invitations. Gordon was also not sure that he was ever invited to be involved. He said, “I don't know. Not really invitations. I mean, she'd come home with homework and always wanted it done but... I don't know, wasn't really asked or

something. The idea of a physical or tangible invitation seemed to perpetuate among parents. Parents were looking for deliberate and obvious calls from schools or teachers to get involved and did not consider homework as an invitation. Mrs. Joyce felt that there was a misunderstanding that homework wasn't seen as an invitation to be involved.

Tanya and her husband attend all parent-teacher conferences and do get information they requested for, but believed she had never been invited to be involved in Trent's math education, "as far as receiving an invitation, no." Parents like Colin, Julia, Tanya, and Gordon considered the study to be an invitation to be actively involved in their children's math education. Gordon said, "Other than this right here, no, they never really ask much."

In order to clear the misunderstanding, parents should be explicitly informed that homework is a way to get involved in students' learning if they wish to be active in home assistance. Parents should understand that invitations are implicit and that outright invitations like this study are not yet the norm at the private school.

School Has Lower Expectations of Student

Apart from teachers who were not prepared to engage parents in ways that were clear to families, and worked for them, public schools also had academic expectations that were mismatched with parents. Colin felt that Craig's school did not challenge him to help him grow academically, "they were happy that he was reading third grade level. I mean, he was a seventh grader when he was there." Colin and his wife spoke to the school and requested they give Craig harder problems to work on but they would respond negatively, saying "well, he can't do it." Colin was adamant that they at least give Craig a chance to try, going as far as saying, "let him do it and fail." However, the school did not comply and told Colin that letting Craig fail would

hurt his self-esteem. Colin continued to describe his disappointing experiences with IEP meetings at the school which then drove them to switch schools.

> Every time he'd have an IEP meeting, you'd go to it and they'd say, 'well, I'm glad. He's gone from reading first grade level to third grade level.' And they felt that was wonderful. Well, he's now in the seventh grade. We didn't think it was wonderful. And we knew he could do better. So then once we got so frustrated with that, we brought him down here. And he went from third grade level to seventh grade level in one year. (Colin)

Julia felt that Jason's previous school had no expectations of him catching up with his peers in the regular classroom. She said that "in his prior schooling, [Jason] was just kind of … forgotten. Just pushed back in to the corner and eventually he'll catch up or he won't. That's kind of the attitude they had at other schools." Julia had similar experiences when she was schooling. She "struggled with math all the way through school" and "was never a very good math student." She recalled being "very lazy" and would stop trying "when it got too hard," especially when it got to algebra. Julia recalled that she "struggled with the concept and there just wasn't enough help for [her to] ask [her] teachers and [she] never felt like they had the time to tell [her] how to work something." She concluded that "if [students] didn't catch on quickly [they] were left behind." As such, she "stopped caring" and didn't want to learn it anymore.

The negative public school experiences showed a lack of support for parents and did not give them confidence that teachers and schools would value their involvement or provide timely help. Parents who attempted to advocate for their SWD, contacted teachers for help, provided feedback, were led to believe that PI was not valued and in fact, schools and some teachers found it bothersome.

Summary

The six parents in the study had both positive and negative experiences as students, varied in how good a student they were, and all believed they should be involved in their children's education to varying degrees. How parents are involved depends on the family's culture, child's needs, and the parent's understanding of and ability to cope with their child's needs. These experiences helped them build a perception of PI which ranged from overwhelmed to comfortable. Teachers perceived PI based on past experiences and appear to subscribe to the deficit or curriculum enrichment framework. They felt that parents were better equipped to support the curriculum enriching framework and the partnership framework.

Parents conceptualized PI based on past experiences with schools and children, resulting in an imbalance of the responsibility partnership. Lack of support frustrated and distanced families from the public schools; especially when SWD were unceremoniously left behind or confused by the lack of instructional consistency between the home and school. Late or unconstructive parent-teacher communication in the past disappointed parents and made them realize their children had been "[swept] under the rug." Parents did not feel they were ever invited to be involved in learning and only played supportive roles in a curriculum enrichment model. Parents' expectations of their children tended to be higher than teachers in the public schools. The schools showed a lack of support for parent views, expectations, input, and involvement, resulting in parents conceptualizing PI as having little effect on their children's math learning.

Sub-Theme 1.2: Home Factors Contributing to Parents' Conceptualization of PI

Parent Availability and Parent-Child Connection

Each parent brings his or her own set of skills and prior knowledge, beliefs, and expectations to the table and that results in a different experience for the child. In each of these six households, one parent was usually better at math but that parent was not always the one assisting the child. When both parents were available and had the ability to teach math, the parent-child connection determines which parent gets involved. The decision on which parent can be involved is more straightforward when only one parent is available or equipped to provide assistance. A student's learning experience also changes with the teacher and parent instructor. In Colin and Craig's case, Colin said he and his wife split the assistance by content knowledge. He said that his wife "is terrible at math. [He's] terrible at English and Science." and she was "more of the science uh... geography type person and [he's] more of the math person" so he has always been more involved in his son's math learning.

Tanya commented that it would be really interesting to see how the parent-child home and school sessions would have turned out if it had been her husband working with Trent. She said that it "would be really different." Tanya helps Trent with his math homework even though Tanya's husband is better at math. Tanya and Trent shared anecdotes unrelated to math about how they processed information similarly, learning preferences, and thought of the world in similar ways, making it easier for them to communicate. Tanya believed that her husband "is capable of teaching" math. She recalled, "I took statistics in graduate school. I would not have made it through if it weren't for my husband sitting down with me - every problem through the homework." Tanya's husband was interested in providing assistance as Tanya recalled, "He's always been interested to get some sort of handle on what they're doing at school so we can support it at home." However, father and son working together have been problematic. Trent explained that they "just don't really connect that well when [they're] talking about it." With a

big sigh, Trent reenacted a scene from a lesson on fractions a while back to demonstrate the math disconnect that they shared.

> 'You need, you need to make it a whole number.' 'I, I know dad, but how do I do it?' And he just wouldn't understand what I meant when I said that. Like... he's just saying, 'Well you need to make it a whole number.' 'Well, I know. But how?' And he would... and it'd just go on like that. (Trent)

Tanya and Trent shared a math connection, which is why she generally helps him with his homework. She explained that she does "a lot of picture drawing" because she understood that Trent preferred to learn with visuals. Her husband, on the other hand, "sees it in his head. He can't transfer that to Trent so [she does] as much visual as [she] can." Trent was asked if he would like to do more BAIP activities with his mother and his response supported the parent-child connection that he shared with Tanya, "Well, generally I like um my mom to kind of explain it to me. Like to get me started so I know what I'm doing and then I like to do it by myself after."

This idea of a parent-child connection or disconnect over math is also evident in Angela's case. Angela and Amber were observed to be comparatively less comfortable working together in the same roles as the other pairs during the parent-child school session. Angela relied on her daughter to lead the session and did not appear as prepared to teach as the other parents did. This difference could have stemmed from a totally different view of how parent-child sessions should be, where the child is empowered to lead and learn. However, after speaking with them both, it seemed more likely that infrequent sessions of working together or from feelings of frustrations that they felt from not seeing things in the same way led to this arrangement. Angela reported, "My husband has the rapport with Amber, the two of them connect. Whereas my son and I

connect. So I will always help my son with his homework. When it comes to Amber, he has a way of getting her to do what needs to be done. (laughs) So he does a lot of that with her." Amber's description of the assistance available at home supported Angela's description, "When I do like projects, I either do some myself or with my father. But um when I'm having trouble and no one's really there, my mom comes and help me." Angela felt that her husband is a very patient person and she felt that that makes him a much better teacher than her. When she gets frustrated, or wishes to avoid frustration, Angela would ask her husband to take over, "Hon, come figure it out and help [Amber] with her homework."

When parents are not both equally available to their children because of work reasons or have different levels of content knowledge, one parent ends up playing the more active role in providing home instruction. Gordon and his wife were both working parents but Gordon had a schedule that allowed him to be home with his children for longer periods of time. During the post-observation interview, Gwen was asked if she would like to do more of such BAIP activities and whether she would do them with her father or her mother. She said "My dad", to which Gordon asked, "What's wrong with mommy?' Gwen answered "She's not home!"

When neither parent is able to constantly provide assistance, children seek out help from the school or home tutors. Julia was not comfortable providing math assistance beyond grade three and her husband worked long hours so Jason usually asked if "he could come to school early so that he could get math [help]." Families seem to work out such arrangements naturally; approach children's teachers, or hire tutors when no one within the family is able to provide help. Making such decisions is also perceived as part of PI.

Parent Homework Support

Parents' perception of their involvement changes with the interaction they have with their children. Positive feedback from children and pleasant parent-child experiences encourage further involvement. A common parent-child experience is helping one's child with his/her homework. The lack of resources or tools for parents makes it tough to provide the needed instruction or support. Gordon was not the only parent who had negative learning at home experiences, i.e., butting heads, not getting homework done, frustration. Julia recounted her general experience trying to provide her son, Jason, with homework instructional support. The worst parental support encounter Julia ever experienced happened when Jason was in the third grade. He brought home a worksheet that needed him to use a new strategy to solve for the solution. She recalled that neither one of them was familiar with it.

> One time he brought home something called lattice math and um... at the time, it was relatively new or newer to the school district and we didn't know what it was. And there were no, there were no notes, or no directions on how to... to do these problems. So I know that um, he got a big F on that paper. And you know, and it was simply my fault because I didn't know. (Julia)

Julia tried to explain how to work out the sum in her way, the traditional way, but that still meant that the worksheet could not be completed correctly.

> I saw a problem, it was 5 plus 9 or something simple, and I'm like "Well, Jason, it's 5 + 9!" And you know, I tried to show him old school math and his teachers were teaching him this lattice math and I could not help him. And part of the problem was to fill in the lattice and you know, he got counted off for that because I had no idea where he was supposed to put the numbers. (Julia)

That negative experience was a turning point for Jason and he stopped asking Julia for help with his homework. Instead, he would ask her to bring him to school earlier so he could consult his teachers. Julia admitted that even if he did ask her for help, she wouldn't have been able to as he had "outgrown general math at this point" and she "rarely understand any of that."

> Um, usually I wouldn't understand what he was trying to accomplish with the problem. Um... and then he would get frustrated and there's nowhere to really turn other than go back to school the next day and say, "we didn't get this answer because we didn't know how to do it. (Julia)

The negative experience with Jason was not made better by the fact that Julia did not feel confident teaching. She recalled "[struggling] with math all the way through school," and described herself as "never [being] a very good math student." Such stories serve to strengthen the deficit or curriculum enrichment model in the conception of PI, where parents do not feel or are not valued as intellectual resources. To provide Jason with the support he needs, Julia enrolled him in the private school. She felt that the private school successfully took on the responsibility of supporting Jason's math education, met her expectations in utilizing appropriate teaching strategies and approaches to individualizing learning for each student. In fact, Jason's "teachers here at [the private school] have a big role in his math right now." She claimed that they have been doing "awesome as far as their responsibility."

> They spend whatever time is needed. They go about any direction that is needed and I think they do it based on each child. Each child learns in such a different manner. I think that they take the time to figure out how this, this particular child is going to learn and then that's what they go with and I think that they care, which is different than public

school. They actually care about getting the child to understand what they are doing and be proud of their work. (Julia)

Julia could tell that Jason trusted his teachers to help him when he had questions. Jason would tell Julia that he needed help with his homework and he wanted her to bring him to school early. "He's like, 'I need help with my homework. You need to take me to school early.' He doesn't even say 'I need you to help me.' He's like 'just take me to school.' So, he definitely doesn't want me to have anything to do with his homework. Not his math." Unlike Gordon, Julia's perception of PI is providing Jason with the resource he needs, i.e., his teachers. These negative experiences with home instruction have helped form a different definition of PI in Julia's milieu.

Some families have older children help as instructors when parents are unable to provide instructional assistance though it doesn't always work out. Julia recounts how different schools used different methods for the same topic and it confused her children whenever they tried to discuss math problems. They may start out on a problem the same way but then one "goes a different route than" the other.

[Jason] even has asked his little brother, who also, is learning um pre-algebra at his school. And the teaching um, is so different from public school to private school. You know, um [his brother's] like "well, this is what we do" and Jason's like "well, this is what we do" and it's so different. They're like... they can't help each other. (Julia)

Julia confessed, "I don't have the knowledge to know which one of them is right. So we often come to different conclusions on our problems."

Angela has her older son help Amber because she believed that he would be a good instructor. Angela had a glowing description of her son, "an honors student and he's good at

everything. He's been a... he was our golden child." This seemed to work out well for Amber, who said, "Now, my brother... HE... He's the one that actually taught me how to divide you know. And I thank him for doing that because like... dividing is like my favorite thing in math." Having a sibling provide assistance does not always work out.

Marissa used to home school her son Miles, and did so successfully for about a year. When she was homeschooling, Marissa found herself "constantly finding activities, taking out books, trying to think of ways to enrich this kid with this voracious appetite for numbers." Marissa said, "I find that I think about math differently now and I do math differently in my head than I did prior to teaching my children." She has both conceptual and procedural understanding now after having done the research. Miles enrolled in the private school and homework support was still not a problem. When Miles asked for help, it was rarely about understanding math concepts and more a request for "a physical body in the same room... to keep [his] anxiety levels down." Marissa recalled that Miles "never needs [her] to explain concepts to him. If he has, maybe it's been once this year." Although Miles had few problems with conceptual understanding, he had not gotten into the habit of executing procedural steps in detail. Marissa said this was a disadvantage with more complicated math as he finally realized, ""not all math can be done in my head. I can't do it all in my head." She would tell him, "You know, if there's a problem with 17 steps, you got to be able to show at least 15 of them." A key component of PI is homework help. Though parents know it is important, they have varying reasons explaining why they can't or aren't able to provide support.

Summary

Parents who are most or more involved in assisting with math at home depends on whether he or she is available, has the content knowledge, and most importantly, a connection

with the child. Being available and able to provide instructional assistance alone does not guarantee an engaging parent-child session for either party. A parent-child connection or understanding seems to reduce the frustration and quarrels that occur when parents provide their children with academic assistance. Conceptualization of PI is as dynamic as the contextual factors that affect each family. Although factors vary across families, parents believed that the SWD should receive help, even if it is from someone else in the family.

Sub-Theme 1.3: Teachers' Conceptualization of PI

Teachers believed that PI was important but felt that they were most responsible for students' academic success. They felt that being teachers at a private school meant that they had to relieve parents of the burden. Teacher anecdotes from their public school experiences suggested that they tried to cater to students who were slower than their peers. However, curriculum demands often forced them to move on. Teachers also had certain behaviors that they expected of parents and a list of undesired behaviors that would transgress the teacher-parent boundary.

Expected Parental Behaviors

Teachers liked the idea of a parent resource supporting PI but had concerns that it would be too much work for parents. Mrs. Joyce described her idea of PI as the parent providing feedback instead of "actually sitting down and necessarily doing the homework [with the student]." She felt that students should work independently and parents can pipe in to say "check it over" or "hey, are you finished?" Parents should follow through to find out if students are really done with homework. She has had times when she "sign[ed] their point sheet but (laughs) homework wasn't done." On the other hand, Mr. Mark noted that "math is the kind of thing, if they come back with all the answers right, then you know their parents are helping." Mrs.

Chelsea added that “you send homework home and there may come a point where parents are no help, or you have parents that will do their son's or daughter's homework or... I haven't seen that so much here but in my previous experiences... You know, or no homework done at all, you know, that kind of thing.”

Mrs. Joyce candidly said that teachers, “don't want micromanagement or helicop[tor]... we don't want a parent saying, ‘this is what they need ...’” as teachers are trained to do what they do. She also said that teachers “don’t want [parents] doing the child’s homework but [they] want some involvement.” For instance, knowing how the child is doing so that their results don’t come as a shock. If students have trouble with a concept, then the parent can work on it together. Mrs. Joyce noted that some of the parents, at the private school, that she was in contact with were “overwhelmed to begin with ‘cause their students have massive issues.” These parents turn to the private school and its expert teachers thinking, “Can you relieve this, you know burden, or overwhelmed-ness? So that we’re not sending them here for you to send them back to us so that we can totally do everything that you do at school. Or else, why send them there?”

One parent behavior that is a double edged sword is feedback. Content of feedback ranged from curriculum coverage, and curriculum speed (Gordon and Gwen), to the amount of homework assigned to students. Mrs. Joyce commented that it is about balancing too much or too little homework. If teachers assign too much homework, “then the parents are like, ‘I’m spending all my time doing the homework with them.’” Parent involvement raises “a funny kind of question” where teachers will say we “need parent involvement ‘cause it makes them more successful students. But at the same time we want the student to be independent.” Mrs. Chelsea said she told parents that if and when their children struggle with homework, they should send her an email to inform her. She would not punish or discipline the child because of that. The

feedback would tell her that "what [she'd] given them is not appropriate in their homework and that [she would] need to reteach something or explain something."

Mr. Mark felt that parents expected to be told what to do and "really like being able to know what their [children's] homework is, and when it's due and things." Mr. Mark said that he has good working "relationships with a couple of the parents" where they've dropped the formalities of "Dear Mr. Mark or something in e-mails." He said that he "know[s] the parent so well, it's just like [they're] friends talking on the phone." He expects them to email him questions when working on the distributed practice sheets he assigned. Parents would ask questions like, "Hi, we're adding another problem tonight. Does this seem reasonable?" He described it as a "nice relationship with parents that you can be talking about their child's learning from day to day." With such a close relationship working towards math learning, one boy made "three or four years growth in math just in one year!"

Teachers Most Responsible For Teaching

Mr. Mark observed that parents have different "level[s] of interest in teaching" and teachers may not know what that would be. He added that "parents are not teachers" but "it doesn't mean they can't teach, obviously." He iterated that when the parent resource is made available, it is given to "a broad cross section of parents who are either really interested, not that interested, [or] not interested at all. Capable, somewhat capable, not capable at all." Mrs. Joyce commented that parents are not typically strong at math, which is "another problem that we have with so many of our parents, especially at the higher level math. The kids go home and their parents are like 'I cannot do that.'" A lack of understanding and confidence in math is "what [her] parents usually complain about." Thus Mrs. Joyce felt that the parent resource could give parents "the opportunity to learn a concept themselves, to make sure that they feel confident in it."

Mrs. Chelsea remarked that parents may be "tired, they worked all day" and "the last thing they want to do is math homework." Mr. Mark noted that "it could be just a perception thing on the parents' part" but he believed they would say, "Oh man, I have to do all these things with my son or my daughter. And why aren't' they doing all these things at school?" He added that "some [parents] maybe have zero interest and they're thinking, 'Why are you asking me to do this? You should be doing all this work. You're the teacher, you should do it. That's what we pay you for.'" Mrs. Joyce too did not want parents to feel that teachers were pushing the responsibility of teaching to the home; therefore the burden of teaching should not be reflected in the parent resources.

The parent resource should simply be a tool that can be used when needed. Mrs. Joyce noted that "the goal is to have resources available to parents to help their students if they're not getting it." Parents should not be thinking, "Okay, now I've got to go and re-teach what she taught." Mrs. Joyce hopes that with the parent resource, parents will feel like, "I can help! I am here; I have the resources to help my student." She emphasized that "it's not [parents'] responsibility to really teach the lesson. That's still my responsibility." What a parent resource should do is to "help [parents] understand how their students are progressing and what's going on." Angela echoed teachers' concerns about parents preferring not to get directly involved in instruction even though the lessons provided important content refreshers. In order to help Amber with her homework, Angela said she would have to "maybe get the chapter of the book and go through it" but she would much "rather hire someone." It would seem that teachers and parents did not share the same level of understanding of PI. Teachers are unduly worried about getting parents involved in supporting students. These concerns may apply to students with less

desire or need to be involved. However these six parents of SWD want to give their students as much help as they can and were not as overwhelmed as teachers had expected.

Teachers' Experiences in Private and Public Schools

Teachers agreed with parents that the public school system was less conducive for SWD. They were sympathetic with parents who were advocates for their children. Mrs. Chelsea described the disparity in pace and the use of math standards as "the nature of the beast." She felt that teachers had a more regimental approach to teaching in public schools, "you're kind of lock-stepped. You have to just march on. March march march, you know." If students fall behind peers, "Well, too bad. We got to keep moving." Performance as dictated by standards is the emphasis in public schools and the goal for those who fall behind is "to remediate, get up... you know, so they can be up there with their peers and continue on. That's the hope, you know. But for, not everyone is going to work that way." Having had many years of experience teaching in public schools, Mrs. Chelsea said that the private school was a "rarity" that gives SWD that chance to catch up.

> "This is a rarity here, as far as, having a school where every kid has an IEP. Where every kid has something that they need to work on. Be it academic, behavior, or whatever. And I think it's just unique and different and public school isn't that way."

The concerns of these private school teachers were more considerate of parents' personal motivators and family and life contexts than public school teachers. However, this fear of placing additional burdens on parents could translate into fewer invitations sent to parents to be involved.

Summary

Teachers appeared to subscribe to the curriculum enrichment model at times based on their anecdotes of past experiences and expectations of parent behavior. They believed that PI is

important but felt that as educators, teachers had the most responsibility for students' success and did not want parents to be overly involved. Teachers appear to have carried over some worries from their public school experience in conceptualizing PI in the private school. This may have resulted in the conceptualization of PI that inhibits the forging of a partnership model in the private school.

Theme 2: Parents and Teachers Have Different Expectations of Parent Resources

Having different experiences and perception of PI, teachers and parents also placed different value on the parent resources. Teachers were not as wowed by the comprehensiveness of the parent resource and worried that it would be asking too much of parents. They felt that having a parent resource was good to have. It is "a great program" but like the textbook, "it's not everything." Mrs. Joyce and Mr. Mark were less enthusiastic about the design of the parent resource within the BAIP process than Mrs. Chelsea. Teachers wanted parents to have tools; alternatives to the textbooks used in class, but did not appear to have a clear idea of what those tools entailed. Either the idea of BAIP was not clear to teachers even at the end of the study or they did not think it would work.

Sub-Theme 2.1: Teachers regarded it as an Informative Tool but Parents regarded it as a Teaching Resource

All parents want to help their children if they can (Hoover-Dempsey et al., 2005).. However, many parents in this study did not do well as math students or have forgotten how to by the time their children are learning it. Parents thus lack the confidence and sometimes, the

content knowledge, to teach their children. This creates doubt in teachers' minds as to how much parents can provide home instruction.

The teachers took it upon themselves to test the BAIP for viability in their private school. Through no prior planning, Mrs. Joyce evaluated the lesson that she used "to see how well this would work with kids who have special needs," Mrs. Chelsea assessed the resource, and Mr. Mark tested the system for feasibility and usability. Mr. Mark was concerned about the content of the BAIP resource and its applicability to the students. He stressed that their population of students required carefully picked material that would cater to the special needs.

> 'Cause the guys we have are moderate to severely learning disabled. These aren't just mildly learning disabled kids. These guys are... uh have usually not one uh... like ADD or something. They may be ADD and then may have some compulsive disorder, Tourette's syndrome. There could be a lot of, you know, different things. So we've got... a lot of complicated kids. But largely with attention problems. Attention and focus and memory problems. So um, so the materials have to be... (sigh) picked carefully. Yeah. Have to pick them very carefully. (Mr. Mark)

When Mr. Mark evaluates math programs, he looks at how the content is structured in terms of conceptual and procedural understanding, "I think what I wanted to see as I was doing this one time through was, "What does A to B look like? Do I like going from A to B? Does it seem sensible to me? How can I? What advantage does this give me? You know? Toward the final outcome. And um, you know that's one thing I kind of looked at through the process, was, 'Is this material advantageous?'" He concluded that it looked okay but he would have to use it over an extended time to get a better idea.

Teachers who participated in the study took their first look at the parent activity during the teacher interview and all three teachers found the idea of a parent resource useful. Mrs. Joyce noted that though she "didn't see the parent resource, but the whole idea... the why [she] chose Craig and Jason is that [she] wanted to give [their parents] a tool to help their kids with their homework so it wouldn't be frustrating." She felt that the parent resource could be "almost like, a self-tutor" and would be useful when parents think, "Okay, I don't have the tools to help my student." She imagined that parents "could sit back and say, 'hey, this shows you how to do it.' So let's go through this together." She hoped "to give [parents] a tool to help their kids with their homework so it wouldn't be frustrating." Also, she wanted parents to "have the parent resource if the kids are not kids that are going to ask for help and they know their kids are struggling." Mrs. Joyce added that the availability of the parent resource would inform parents of what went on at school and to determine how much help they needed to provide. She recalled parents who said, "I'm at wit's end. I don't know how to help my student. Teacher says they're struggling. We can't get them to a tutor. At least I want to know what's going on." Although Mrs. Joyce said that the resource would be good for parents to have, she worried that it may be asking too much of parents.

However, parents always want to help, and keeping abreast of one's child's progress and school experience is very helpful towards that end. Mrs. Chelsea believed that "parents want to know what their kids are doing" but not having resources consistent with instruction, to help them keep track of what is being taught or learned, gets in the way of staying up to date. She depicted what tends to go on at home based on her prior experience of middle school students and their parents, in the scenario below.

> You know, parents say, "Got any homework?"

(Mimics kid saying this in a bored tone) “Yeah”

(Mimics parent) “What do you have?”

(Mimics kid saying this in a bored tone) “Math”

Mrs. Chelsea noted that some parents may keep track of their children’s homework in detail while some are less on the ball with the specifics. She said that “some parents are real (knocks the table twice to symbolize strict) about that” and may check their children’s math homework. However, “more often than not, parents don't.” If they do check, it would most likely be a one-liner, “did you get your homework done?” which does not tell them very much at all. Having the BAIP parent resource circumvented this issue and was “probably the biggest thing [she liked] about it” because students could demonstrate their understanding of math to parents.

As a communication tool and information resource, Mr. Mark thought the idea of a parent resource was “fantastic” and said that he “like[d] the idea. [He would like] parents to know what the kids are learning.” He believed that parents would “love to be able to go online” and have access to information to “know what their [student’s] homework is, and when it’s due.” He saw it as a “a nice relationship with parents that you can be talking about their child's learning from day to day to day to day” and which could positively affect test scores. He thinks it is great “as long as [parents] are interested” and the resource “is not a bother to them.”

Mr. Mark added that alignment may help coordinate perceptions. He said, “There are grades in math and then there are perceptions about students' ability. And I think that this could uh... coordinate perceptions. Like parents may have a completely different perception of their students' performance and ability um... than the teacher.” Mr. Mark was animated when describing how parents’ inaccurate perceptions may affect the parent-child discourse about math. He explained that parents love their children “and think they're really wonderful and special” but

“it kind of shades their perspective a little bit on how well they're performing.” Sometimes, the opposite may also happen and that puts a lot of stress on the child. There are some parents who are “hard on their student, (fist thumps on table) they don't think they are any good (fist thumps on table they don't think they are performing very well (fist thumps on table), they (fist thumps on table).” Mr. Mark would tell them that their children were doing great but parents still asked him a barrage of questions “Is he doing this? Is he doing that?” Mr. Mark felt that using an aligned model like this might help with addressing those questions; so “it's not as bad as they think or it's not as good as they think.” The BAIP parent activity could provide a reality check for parents. Mr. Mark commented that the parent activity is “good feedback for parents you know, when they can see how well their kids are performing.” He recounted a story of a mother who insisted that her son had retained what he learned, even though he was telling her otherwise. The student’s mother insisted, “I know my son knows all those things. He's had those before. I even taught him some of those things. I know he knows them.” Mr. Mark responded with, “Well, he forgot them. ‘Cause you know, he needed more practice on them, so he doesn't really know till he can show you he knows them. And right now he can't show you he knows them. He forgets all the time.” The parent resource would have been a “good communication tool, yeah. Parents can see right away what their kids are capable of or not capable of or needing help on.”

Mr. Mark felt that a consistent “little system that the parents and student are going to maintain for many years” would be beneficial for learning and PI. “When something can be predictable for the child and the parents,” it reduces frustrations and positively affects students, perhaps those like Gwen. Although Mr. Mark would like “parents to know what the kids are learning,” he also thinks that the BAIP program is “kind of a wild card.” For him, the burden of the responsibility partnership appeared heavier on parents with the use of the parent resource. He

was concerned about parents' "level of interest in teaching" and worried that some parents would feel that teaching is a school or teacher responsibility which should not be pushed to the home.

Mrs. Joyce, like Mr. Mark, thought that the parent resource should be more of a communication tool to keep parents informed of what the child has learned in school and how well he/she is doing. It should not become a teaching task for parents. Parents "may not understand exactly what they're doing" but should be able to figure out how his/her student is doing based on home learning activities. Mrs. Chelsea was the only teacher who felt that the parent resource was useful as a teaching resource in addition to being an informative tool. Mrs. Chelsea's class at the private school had the most diverse range of SWD with extreme levels of ability. She seemed to need the most parental help because each child simply needed more support to succeed.

When Mrs. Chelsea took her first look at the parent activity she had selected for her students, she exclaimed that "it's like them being the teacher." After going over it in more detail, she tapped it excitedly with her hand and exclaimed, "See, this is exactly what I wanted. I think, to me, this is what makes the program worth it. It's that the parents have a resource to say, 'How can I approach this problem? It's not clear to me.'" Mrs. Chelsea shared that in both her professional and personal experiences, she has found that "nothing is worse as a parent [than] when [your] child just shows you a worksheet and that's it. There's [no] explanation really on it. There's just a lot of problems, or even textbooks to a degree." She felt that BAIP gives parents prompts and expected student responses so they have "got something more to hang on too as the parent, as the [teacher], as the facilitator in the activity.

Mrs. Chelsea's concern about parents not having enough support was immediately obvious in the parent-child observations. Julia recalled that during the engagement of the lesson

activity, “there was a couple of times [she] kinda worried that [she] wouldn't understand what was being asked” and “then [she and Jason] would be sitting here not knowing what to do.” She laughed as she noted that they “didn't really run into that” scenario, but her initial thought was, “Oh my, what if we get into this and we can't figure it out?” Since the parent resource was not like traditional materials sent home as homework and had scripts to guide the parent, Julia “was a little bit relieved when [she] saw that there was a little bit of... help, after the problem.”

Mrs. Chelsea, like the other teachers, is a proponent of PI and “want that support from home.” However, her expectation of the BAIP was more than purely for informative uses. She wanted parents to be able to extend instruction into the home to provide students with added time on math concepts, “Okay, I know what [my children] are working on. Now I know where and how I can help them. And even if I don't, I have got a resource that shows, that **can teach me how to help them**.” She, more so than the other teachers, believed that parents could help provide instruction.

Teachers felt that the parent resource would also inform parents about math terms and standards. Mrs. Joyce felt that the design and integration of the parent resource in BAIP is “what gives this more of an advantage over Khan Academy.” She is a fan of Khan Academy but bemoans the fact that “it doesn't have a parent resource. Of course, the parent can go on there and say, ‘I’m using this as a resource.’ You know, but it's not specifically designed for the parent.” A tool designed with parents in mind caters to their needs in ways that teacher tools do not. Julia enthused over the parent activity, saying that it “was definitely more guidance than anything that [they had] ever gotten to do together.” She described past activities as being less helpful, “here's your information. Figure it out.” She recalled that she would “go to the bottom a few times to see

if Jason was right on track with his answers. And usually that's not an option with anything that he's ever brought home before."

Each parent activity contains the key math vocabulary terms used, informal Teachable Moments, and scripted Structured Activities with parent prompts and expected student responses. Mrs. Chelsea noted that the direct instruction component in the Structured Activities made it seem like parents were "being the teacher" and she liked "the fact that it has parent prompts because I don't think [parents are] always going to know what to say." Furthermore, finding resources on the World Wide Web is challenging because of the sheer amount of information correct and incorrect resources online. Mrs. Chelsea noted that "there's just a lot of problems or even textbooks to a degree. You know, you have to find it and all this kind of stuff and I think that tools for parents would be a great thing." Parent anecdotes supported Mrs. Chelsea's supposition that parents needed guidance on providing homework help through instructional guides. Marissa noted that students learn "a lot in the classroom and then they come home and they want mom and dad to help them. And there's... this... break in the system where they hope that mom and dad can help them. But more often than not, mom and dad can't. They want to, but they just don't know how." Angela, laughed as she shared that she would hate to send [her daughter] to school with a note saying, 'I couldn't figure it out' or having to call the teacher, email the teacher or something like that." Angela reiterated the sense of haplessness when the parent is unable to provide help, "Cause it is frustrating as a parent, not being able to help your child. When they've come to you...Kids coming to you, they're asking for help but you can't give it to them!"

Teachers and parents often heard students complain that how they were taught math in school differed from the method that parents were attempting to teach. Angela was the only

parent who preferred to hire someone like "a tutor to help [Amber] through that" than to "spend the time to go through that whole chapter and figure it out." Angela, like the other parents, worried that the way they learned and therefore taught math was different enough from their children's experience, and would result in school-home teaching conflicts and confusion for the child. Angela expressed her anxiety when she said, "the way I learned the math is not the way [Amber's] learning it now and so if I try and help her, [and] she gets frustrated too as well." She conveyed to Amber that the methods may differ but the answer would not.

> "Well that's the way I know how to do it, and it's going to get the same answer. So you know, let's maybe work with the teacher. Let's go in before school or whatever. But we could use the resource." – Angela

She would support Amber in getting help in a familiar strategy via the school teacher but was not averse to using the parent resource if she had to. The resource demonstrated support for families, even the reluctant parent instructors. Gordon's anecdote of him attempting to teach his son math shows how parents may be discouraged from providing their child with further instructional help.

> **Gordon reflecting**: "And I used to sit down with my son, and try and teach him stuff.
>
> **Son**: "No dad, that's not how we do it."
>
> **Gordon**: "What do you mean that's not how you do it? I get the same answer as you."
>
> **Son**: "Nuh-uh. It's not how we do it, Dad."
>
> **Gordon reflecting**: So I try to, I try to stay out of it unless they ask for help."

The parent resource was designed for parents and provided refreshers of key math vocabulary used in lessons so parents could use the same terms that students were exposed to. Since students would have covered the material at least once with their teacher, parents did not

have to teach their students from a blank slate. Angela thought about the process and shared her concluding thoughts, “now, I was able to be actually be more involved and at the same time, the kid already knew what she had to do. I didn't have to figure it out. Read the directions over and over again. She already knew.” Even if the child needed a refresher, the parent script was there to guide parents along. This helped to ease parental stress in home instruction. Julia recalled reading through the structured activities in the parent activity and thinking “that [she] might not know exactly what was being asked so [her] immediate response was; ‘I need to look these words up. And figure out what they are asking.’” Since parent activities were meant to be used as refreshers for both parents and students, “Jason already knew what they were asking so that made it a little easier” on Julia. Angela had a similar experience where Amber guided her through the parent resource, demonstrating a good understanding of the topic to her mother.

> She already knew how to do the fractions and the whole numbers and get the common denominators and all that. She's able to refresh me even though I had the sheet to refresh me. And I went through all that. By the time I got with her, I still needed more refreshing. (laughs) And she was able to do that 'cause she had already learned that portion of it. (Angela)

Tanya said that having the parent resource was much better than having nothing to begin with when looking for parent support, “It's a resource. It's something. It's a point where you can start as opposed to you have to build it before you can use it.” Mrs. Chelsea said that if parents needed to provide help, “they’re not having to create, create” and can actually “guide their, you know, son or daughter, through that activity” because the tools are built in to the activity. Mrs. Chelsea thought that “there’s a lot of power in” having the parent activity with “parent prompts and so forth” as it lessens the amount of work that busy yet involved parents face.

Summary

Overall, teachers perceived the parent resource in a more traditional form. One that keeps parents informed of what is going on and that could show parents how much their children are capable of. However, BAIP caters to a different problem, one which was appreciated by parents. Parents felt that BAIP saved them time through timely and content consistent teaching supports (i.e., Teachable Moments, Structured Activities), resources that were not readily available prior to the study. The parent resource empowered parents by giving them access to content, the ability to help as home instructors and an insight into what the student can or cannot do, how students are progressing in school.

Sub-Theme 2.2: Teachers expected Resource Use to be on a Voluntary Basis but Parents preferred it to be a Requirement

Parents in this study are involved parents and have high expectations of the private school. Few parents would decline the invitation to be involved if teachers reached out to parents. However, few if any explicit invitations have ever been sent to parents for their involvement because of a difference in expectations and the conceptualization of PI between teachers and parents. As such, even the understanding of parent resource differs between parents and teachers.

Teachers felt that having the resource accessible reduced parental anxiety, increased parent knowledge and awareness of both the student's progress and what goes on in school. Teachers felt that it added to parent's set of tools with which to help their children. Mr. Mark didn't think that the parent resource "could be a requirement that all parents have to do it" but he thought it could be more of a parent's choice.

> "The fact that parents have voluntary access to parent materials, I think is innately good. It's a good thing. Uh if they really want to be involved, here's where you can go, and here's where you can get your materials. And they are well written and scripted lessons and... I think if it continues. If it promotes math discussion at home, it's great! It's great." – Mr. Mark

Mr. Mark and Mrs. Joyce empathized with the family life context of parents, acknowledging that they may not have the time or energy to be so actively involved. Mr. Mark said the BAIP parent activity "seems like a lot to do" and Mrs. Joyce thought that parents might feel "okay, it's one more thing for me to do" and she did not "want to put any pressure on them." It is true that there will be extra work involved in parents looking at the parent resource materials before engaging in it with their student. Tanya said she would "definitely have to look at the activity before Trent and [her] sat down to do it." How she would structure her preparation included "[looking] at the activity, [looking] at all the words, [looking] up the words, and [trying] to, you know, start building, you know, some idea of what's going on." She would also "attempt to work through the problems, or at least some of the problems [herself] before [she] sat down with him" to keep him engaged. Otherwise, "[Trent would] be falling asleep while [she was] trying to figure it out." However, Tanya warned me that if the resource was accessed on a voluntary basis, she would be "more likely to let it slide" as "no one's going to notice [she] didn't do it anyway, except maybe for Trent."

Miles, being good at math, did not need a lot of practice to understand a concept. As such, his mother, Marissa, felt that "it's not something he's going to do. [Miles is] not going to volunteer for something like this. He's just not. I think other kids might but not my kid." Another student, Jason, said he liked the idea of the parent resource being voluntary instead of a

requirement. His mother took a different stand and said "if this was a standard practice and we knew we had to do this every night, or something like that, then it wouldn't have been such a fight to get him to stop whatever he was doing and listen to me." Julia had trouble getting Jason to stop watching T.V. to work on the teachable moments so she felt that if the parent activities became a standard "educational tool in [Jason's] world, then it would have been a little easier to get it all accomplished."

Summary

Though BAIP is currently set up so that parent activities are accessed voluntarily by parents, the study data suggest that schools wanting more involvement should make it standard practice and have some form of accountability practice in place. Tanya suggested e-mail reminders or having someone check that parents do complete parent activities. This may create extra work for teachers that are not welcome.

Sub-theme 2.3: Teachers focused on possibility of replacing Traditional Homework but Parents focused on the Opportunity for Parent and Child to Bond

Teachers spoke at length about how great having the parent resource was, giving parents another tool with which to support learning at home. The BAIP Parent Activities were designed to be used as complementary resources and not as homework so it was a surprise when teachers and students suggested it. Mrs. Chelsea said she had "never seen anything like it" and that it would fill the gap that was faced with traditional homework. She didn't think traditional homework "provide[d] [parents] the tools **they** need[ed] so that they [could] explain something." She observed that with traditional homework, "there may come a point where parents are no help,

or you have parents that will do their son's or daughter's homework or... You know, or no homework done at all, you know, that kind of thing." Angela was in agreement with Mrs. Chelsea and said she didn't like that some teachers, "just send the homework home and the parents have no idea how to do it." Two students said they would prefer using the parent activities as homework in place of traditional homework. Amber suggested that "maybe instead of giving [her] like homework, [she] could do like an activity on here for like homework" on the computer. Craig thinks "it's a lot better than homework" because the lesson was less repetitive and the BAIP parent activity "gives you a little more interaction rather than straight repetitive answers."

Parents complained about the format of traditional homework and its lack of instructions for parents who are less familiar with content and math strategies. Julia recalled how her son, Jason, recently brought a worksheet home and "asked for help and of course [she] couldn't figure them out. She recounted how Jason "went to the computer and Googled it and tried to figure it out." He looked up "math programs that [students could] use and he just couldn't get it to work." "So [they] had to come into school early so that he could get extra help." Julia said that their "default is the computer" to search for resources and it is possible to "find a lot of resources and information out there. It's just sometimes; you have to sort through so much information, that by the time you get to an answer that may or may not be right, you're just kind of... fried." Other than being exhausted from the search, she lamented that "there's not a real good source that we can find, that you can just plug in the equation and then it'll work you through it."

The difficulty in finding the appropriate resources increases with time as the student does more advanced math. Mrs. Joyce said that her students were working on pre-algebra at the time of the study, which was not "hard stuff" in her books. However, she anticipated students are "not

going to have anyone to assist them" when students "do get to harder things," "so that's why [she said] they need other tools" to guide them along. Mrs. Joyce believed that having the parent resource will give parents the "freedom to realize, 'this [text]book is hard' or 'I don't like this method'" and turn to the new tool to simplify the search for resources. Colin recalled "the math book that [his son] had [which he] found to be real confusing." He described himself as "not a big math person" and both of them would struggle on completing homework. Colin would "go back to the book, and that confused [him] a lot more." Colin did not find the textbook selected by the school to be beneficial. He felt "like it's very confusing. And [he didn't] have a learning disability. And if [he] was confused reading through it, [he knew] Craig's got to be totally confused."

> It just doesn't give you a clear understanding of what... when it tells you to do something; it doesn't tell you why you're doing it. It just tells you to do it. It gives you one example and then expects you to go on and do the rest of it. And I just, sometimes I don't get the full, I don't get the whole meaning out of the example. (Colin)

So father and son would turn to the internet and go to Khan's Academy or Google to look for resources. Sometimes the internet gave "a little more detail and then [they could] go from there" but Colin would teach "it how [he] was taught and [Craig] goes, 'Oh, that ain't how [my teacher's] teaching me!'" Colin would then be bewildered and worried that he was further confusing Craig.

What Colin and Julia wanted and needed was an accompanying guide or software for the particular homework that Jason was working on. According to Mrs. Joyce, the school's "[students] can be really rigid" about math procedures because of their learning needs, which is very frustrating for the parent attempting to help. Mrs. Joyce felt that BAIP, as an alternative tool

would let parents say it “doesn't matter. Math doesn't change. Doesn't matter how you get there.” The BAIP parent resource would save parents some time from searching the world wide web for suitable resources since it is consistent with classroom instruction. They can put the saved time to use on practicing the math concepts in the activity.

What teachers did not realize was that BAIP Parent Activities facilitated bonding between parents and students. Bonding is facilitated when parents and their children engage in recommended activities in both Teachable Moments and Structured Activities. Mrs. Chelsea asked if Angela and Amber got along during the interview and was relieved to find out that they did. Teachers had seen Amber act out as she was “having difficulty, and being critical of her mother” but has “come a long way” since. Correcting Amber was a challenge because she thinks “she knows everything already.” However Angela and Amber got along really well during the observation and were one of the more physically and verbally affectionate parent-child pairs. It seemed that the study session gave mother and daughter an opportunity to bond and get to know each other better. Angela was proud of how well Amber did, demonstrating over the Structured Activities session “that she's learned it, and learned it so well that she can even teach her mommy.” Amber found the session “a little bit entertaining,” and made some discoveries of her own, “I was learning my mom likes to do fractions sometimes. And uh, I also learned that she's actually quite good at... fractions too.” In the literature review, Van Voorhis could not identify a cause for more positive feelings about math when parents were involved and suggested that one possible explanation could be the experience of parent and student working together with “better or clearer instructions about how to complete math skills and how to discuss the use of math skills in real-world situations” (Van Voorhis, 2011, p. 330). I posit that in addition to the useful

materials, the positive feelings about math could be due to parent-child bonding over humorous interactions.

Through anecdotes and observations of the parent-child school session, it seemed that parent-child interactions often took a humorous turn that provided opportunities for bonding. Parents either get carried away with parenting or children get bored and attempted to test their parents' patience or attentiveness with tricks and word play. Students who were more extroverted tended to experience this more. The last time Tanya and her son worked on schoolwork together was the night before the observation. Trent said, "My mom was helping me figure out comprehending word problems." When asked how that worked out, Trent reported that it went pretty well "but sometimes we kinda get into arguments occasionally." Trent then turned to Tanya and said, "Like last night 'cause... I kinda got mad last night 'cause you were right picking my nose or something." Tanya agreed, explaining, "Scratching something off the end of his nose. It created a huge argument." Tanya was distracted by wanting to mother her son and let the humorous incident get in the way of providing instruction. Trent was still miffed about the incident as he said, "And then when I said OW! She got... she said 'pay attention!' I'm... you're picking out my nose, come on. Give me a break." However, Tanya said, "But we got back to it. We got it done with," and they managed to get the situation under control and got the word problems figured out. Though events that occur look like distractions from the task, they are in fact times where parent and child share a moment.

Trent showed the tendency to create humorous distractions for himself during the observation. Tanya was asking Trent to measure the dimensions of several different colored containers and then write the information on a sheet of paper as a number line. Tanya instructed, "You want to go ahead and circle that three [points at 3 on the number line] and maybe write

blue underneath... underneath of it? [Puts the blue container aside.] Then we'll measure this one." Trent had been keeping an eye on Tanya and watched her reaction closely when he requested; "Can I say green?" Tanya rejected his request by stating that the container was blue. Trent tried again with "Oh… Can I just say green?" but was ignored so he wrote blue instead of green. They measured the height of another container, a red one, and Trent asked, "Do you want me to write green down here," as he pointed to the number line. Tanya muttered in agreement then suddenly realized she had just been tricked. Trent giggled as Tanya laughed and said "No, red. Not green. You tricked me." She poked Trent gently in the arm and he laughed out loud. Trent even looked over at me to smile gleefully. They continued with the activity and Tanya asked Trent to compare the size of the containers and to state which one was bigger. He responded with, "Blue is bigger than green" then looked at his mother for a reaction. He was not disappointed as she paused, looked at him, then corrected him with two words, "than red." Trent smiled cheekily as Tanya repeated herself and he wrote the correct statement on his sheet of paper.

During the observation, Trent was witnessed in yet another attempt to trick his mother with word play. Tanya was attempting to explain the left and right side of zero on the number line in real-world terms using money and asked Trent, "Would you rather owe me a dollar or owe me three dollars? Trent quickly responded with "three," his head tilted slightly, hand under his nose, and looking at Tanya. Tanya went on to ask, "Okay. Would a golfer rather be one under par or three under par" when she suddenly raised her voice, nudged Trent with the back of her hand, and laughed. She exclaimed, "You'd rather owe me three dollars? You stinker." Trent sat upright at her outburst and laughed heartily. Both were highly amused. Trent said with a laugh, "I wanted to see if you'd catch that." Tanya acknowledged his attempt at testing her and then worried that his erroneous answer was based on lack of understanding instead of mere trickery.

She checked his thinking saying, “Okay, you’d rather really owe me one dollar right?” Trent answered positively to her relief.

Apart from trying to trick his mother with the word play, Trent made funny comments that amused Tanya greatly. She tasked Trent to draw a number line, “I've done it twice. It’s your turn.” Trent then hunkered down to draw tick marks for the number line, looking focused. Both his arms were on the paper, one to hold the ruler down on the paper and the other to draw. His head was not far off the surface of the desk when he said jokingly, “Ay... I might go into the doctor about OCD.”

Throughout the observation, Trent had been complaining about the inadequacy of his chair so Tanya offered him her chair, which was slightly bigger. She teased him, “Alright, we'll trade. ’Cause my brain works even if I sit in a little chair.” Five minutes into more activities, the taunt was fresh in Trent’s mind as he made a comment out of the blue, “I don't have kelp for brain like you.” To Trent’s chagrin, Tanya was not familiar with the term and they spent some time trying to understand one another. She asked if it was like SpongeBob, a cartoon character, and he responded incredulously, “Have you really never heard that phrase? Come on….” Tanya continued working on the number line after saying, “I've heard a different phrase. It's not very friendly.” Tanya and Trent seemed to spend the time well working on math and getting to know one another better.

Summary

Both teachers and parents talked about the possibility of using parent activities as alternatives for traditional homework. Parents could save time on looking for appropriate resources or have alternatives to turn to when traditional texts do not fit parents’ needs. Students said they enjoyed the BAIP parent activity, though a few preferred the Teachable Moments to

Structured Activities. Parents raised the additional benefit of allowing parents to bond with their child. During the observation, parent-child interactions were observed to be peppered with jokes and banter. This was observed to be common for the more outspoken and outgoing students. It seemed that BAIP structured activities, designed around real-world math, offered an opportunity for parent and child to bond and for the parent to better understand his/her child's math progress, thought process, and learning preferences. Though bantering did take time away from the activities, it was observed that the interruptions provided shared joy, engagement, and even managed to delay boredom for a while.

Sub-Theme 2.4: Teachers Underestimated Parent's Funds of Knowledge

Teachers Doubted Parents' Abilities

Mr. Mark believed that learning math terms from the parent resource and/or knowing how to engage students in academic activities would add to parenting skills. With reference to the BAIP parent resource, he said "it's good to teach them what the teachable moments are." As a teacher, engaging students in informal learning activities as opportunities arise is "second nature to [him]" and [he does] it all the time." However, he remarked that "a lot of parents aren't like that." He animatedly recounted how he "[could] do that in front of some parents and they'll say 'Wow! That's amazing that you're able' [to do that]. From those encounters, he felt that "parents just don't think about all the things that they can teach their kids." Thus, just "the fact that [the resource is] available" is a nice option for parents.

Mrs. Joyce had her doubts as to how well parents knew how to integrate real-world math into their children's daily activities. Mrs. Joyce "work[s] with [Craig] in the afternoons because "it was becoming a battle with" Craig and his father, Colin. She has Craig three days a week and Colin has him twice for extra time on math. When there are days that he does his homework at

home, Mrs. Joyce said “he'll come back with homework done very well.” Mrs. Joyce taught Craig math and knew that he soars when they “talk about things that don’t seem so mathematical. It seemed more common sense.” However, she is not aware of how math is integrated in to his world at home.

> “Yeah, or game stats. Or just real life money. Things like that. All of a sudden, [Craig will] get the language where some of the other kids don't get it. And so now we're working on probability and odds and he's getting it. Which when you think about it, can be a hard concept. But for some reason. But, he does.” – Mrs. Joyce

Mrs. Chelsea incorporated teachable moments into her students’ homework so she liked seeing it in BAIP. She wrote notes to one of her sixth graders who “doesn’t have number recognition, doesn’t have one-to-one correspondence” to practice counting. Such as “count out rigatoni [pasta],” dried beans, or things “that are just around the house.” Her personal belief was that there has been “a real mistake in math instruction in the past.” She doesn’t think that “the real life experience has been tied into it enough” which is “what causes confusion for some students.” If they had “something to anchor on to,” students would find that math made more sense. She talks to Gwen, who loves counting money, about how she could use that math skill at a first job.

> “Gwen and I have talked about how. I said, ‘this is a skill.’ I said, ‘your first job may be at Jimmy Johns. And you're in high school and you're expected. Your register breaks and you're going to have to count out that change manually.’ And I said, “Gwen, you can do that. You're not tied to the calculations of the register. You can actually count out change.” And I tried it with bills with her. Bills and change, and I'm like, show me the different ways you can show. Show me five dollars and 38 cents. I said, “And I don't

want a pocket full of change." So, the least number of coins that you can use. Things like that, she can do that." – Mrs. Chelsea

However, Mrs. Chelsea too had her doubts as to how much parents can do. When informed that parents did well in the observation, teachers did not say much. I showed Mrs. Chelsea the work that Gwen did and she exclaimed, "Oh my gosh!" and then immediately rationalized it with "She's a worker though." Mrs. Chelsea did not attribute any of Gwen's efforts to her father. She did acknowledge that Gordon would understand his daughter's needs seeing that "he has some of those same needs."

Parents Familiar with Teachable Moments

All the teachers were proponents of real-world math but appear to have no knowledge of parents using it with students. Therefore they underestimated parent's funds of knowledge in integrating practical math into the real-world. It was interesting that all the parents mentioned some form of teachable moment that they practiced with their students.

Parents believed that a firm grasp of math will help students function and succeed in the real-world. Parents shared anecdotes of math being useful, and how they taught their children to use math in the real-world. Common uses included counting money, baking, and estimating time. Parents worried that their children did not appreciate the importance of math and its function in the real-world. For instance, Julia firmly believed that "the whole world revolves around mathematics but Jason doesn't feel like it's his place to necessarily know the, the intricate pieces of it." Julia used the running of an ice cream shop to illustrate her point. She said that Jason didn't see how algebra could be useful in the real-world.

"He doesn't think that what he's learning now, the problems he's solving now, in pre-algebra, is going to equate to 'if he owned an ice-cream shop, how much ice-cream

would he have to sell in order to be profitable.' He doesn't, I don't think he makes that connection that the problems he's learning now, although they don't really relate to anything in his world right now, will relate to it later on." – Julia

When Jason was younger, they would use examples related to animals to engage him in math. Now that he is older, they "do a lot of real-life scenarios" that are "just kind of tricking him into math. Jason would use his weekly allowance from his grandpa to make purchases at the local store and Julia would make him pay for the items himself. She ensured that he knew to count the money out and would ask him questions when he got his change, "now, how do you know she gave you the right money?"

Julia believed that young people "don't really think that [they're] ever going to need to know that knowledge and um... and maybe [they] don't need to know how to work the problem but [they] need to know how the problem works for other aspects of life." For instance, they tried to teach Jason ratio when filling up his fish tank by referring to directions for adding water treatment to each gallon of water, i.e. "two teaspoons or tablespoons per gallon or something like that." He was not always responsive and would ignore the directions, so sometimes; Julia would trick him into believing that she didn't know how to do something by saying "let me think this through." She hoped that he would then be more engaged or inclined to do the math.

"We were making cookies not too long ago and I wanted to double the batch. And I was like 'if I have two cups, and I need. I'm doubling my batch and there's a... you know, two cups and a third. How many am I gonna?' He's like, 'Mom, it's this!' And you know, he gave me the answer. I'm just like... So, a lot of times I just act like I don't know so that he'll figure it out. He, he does." – Julia

Julia reported that to date, Jason had not figured out that math was the driver behind these activities, “he falls for it every time so I don’t think that he ever really realizes that we’re testing him.”

Money was a constant in many parents’ anecdotes. Angela said her family “all try and have teachable moments [with Amber], whether it be with money” or something else grounded in the real-world. A typical scenario with money happens at check out. Angela had encounters with cashiers or clerks where she had to teach them to count money, “if their computers aren’t working or whatever and they don’t know what to do with the money.” In turn, Angela often makes Amber count out change when making payments. Angela would say to Amber, “Okay now, you pay her the money. She says its two dollars and forty-eight cents. How are you going to pay her, Amber? Here's the money.” Angela did not want her children to be as lost without technology when dealing with simple math.

Marissa was in tune with the concept of math used in baking. She said that functional math for her was about, “what time do I have to leave to get there on time? How can I double this recipe so I can freeze half of it so I don't have to cook again?” Marissa, like Julia, believed that math was necessary. She recounted an interesting memory, “Someone had a t-shirt the other day that said, ‘spent two years in school learning algebra. Haven't used it since.’ And they had posted that on Facebook. And I was like thinking to myself, how is that possible because I use it every single day.” Marissa described her family as being educationally inclined, and they “occasionally will discuss mathematics because it's a house full of nerds.” She recalled driving her children around and one would ask how long before they arrived Her response would be, “well, we're going at 60 miles an hour and we have 50 miles to go. What do you think?” If Miles said, “mom, I got to get to Pokémon league at two o'clock,” she would respond with, “Well,

takes 25 minutes to get there. What time do you think we need to leave?" Marissa's son, Miles, "is quite independent with math except when he's feeling anxious and simply wants [a] body in the same room while he does his homework." The family plays a lot of games to incorporate math into the real-world. Marissa reflected on the topic of informal teachable moments versus structured learning moments and said, "a quick question (snaps fingers) here and there, over breakfast, over dinner, in the car gets me a lot more bang for my buck than trying to sit down, specifically with [Miles], and doing an activity like this."

Colin would ask Craig to count out change, write checks, or to figure out the ratio for mixing a formula to feed his pet goat. The Teachable Moment section seems to fit easily into family life and parents appeared more knowledgeable about integrating math into the real-world than Mr. Mark or any of the teachers had suspected.

Students Benefit from Extra Practice

Students were engaged in real-world activities not only to learn how to function with math, but also to work on their confidence levels. Craig was a very shy student, very private about his disability, and was not comfortable asking for help from anyone but his parents. His teacher, Mrs. Joyce, noted that Craig lacked confidence, "[Craig] says he hates math. I don't think he hates it, I think he hates the idea that he doesn't understand it because he wasn't given the proper foundation." Colin made a similar observation about Craig and his perception of math, "I think he's kinda got it into his head that he can't do it. But he can. I mean, he lacks the confidence. Let's just put it that way. So he thinks he hates it. But I think the more he did of these [BAIP Activities], I think we will [see a difference]."

At school, Mrs. Joyce has been working on building Craig's "confidence and show[ing] him that, 'you have a lot more but you weren't given the... It's almost like you didn't get the

proper nutrients in math at the age that you needed it.'" At home, Colin and his wife, gave Craig opportunities to use math in the real-world to build his confidence. Colin shared that Craig had problems with money, so they taught him how to overcome that uncertainty by "just making him do it." Colin recalled bringing Craig out and then asked him to make a few purchases at the snack bar. Craig's shyness and lack of confidence meant he did not check the change that he received, nor dared to ask for the right change once he figured out there was an error.

> Well, like one time I gave him a twenty dollar bill and I sent him down to a snack bar to get a couple, you know, like a couple pops and a snack. And he comes back and I went, "where's my change?" And he goes, "they didn't give me any." You know, and I went, "well, you needed to get change." You know. So then I started to go back downstairs with him because it was down at the... uh.. and as soon as we walked in, the lady had the change and stuff there. But, I mean... but since that time. Now he stands there and counts it. (Colin)

Colin has also once tasked Craig to make out a check for him to sign but Craig did not like doing that. Craig also helps with farm work such as measuring out animal feed, and Colin felt that through all these real-world activities, Craig has "gained a little confidence doing that" and even their relatives have noticed a positive change in him. Mrs. Joyce noticed that Craig did really well in math when it utilized common sense, or real-world knowledge, "it's funny, when we do math where we are talking about probability, [and] we're talking about things that don't seem so mathematical. It seemed more common sense, he soars." All the practice with real-world math makes more sense and is more relevant to Craig, which explains his spectacular performance. Mrs. Joyce marveled at how Craig would "get the language where some of the

other kids don't get it" when they worked on game stats, real life money, or probability and odds, the last of which was considered a hard concept.

Gwen's father, Gordon, was less familiar with math being integrated in other real-life activities, and when promoted with the idea of math in baking, he said, "Baking, uh. There's not really that much math in baking. Though I guess if you double the recipe, but... Not that I know of at least." He was aware of the connection between math and money using subtraction and addition, math facts that Gwen still has trouble with sometimes. Gwen's father gave her opportunities to pay for purchases whenever they went to the store. He said that she's getting better at counting her money out. In fact, "before she came [to the private school], everything was just downhill. She didn't really know how to count much change or anything." Gwen has now become really good at it. When describing Gwen's learning preferences and strengths, Mrs. Chelsea exclaimed, "That girl can count money." She had "a container of change to work on [in the classroom] counting money and... she's a whiz." The practice both in school and at home has helped Gwen excel in one aspect of math.

Summary

Two teachers who were more comfortable teaching math had doubts about parents providing instructional support at home as compared to the language arts teacher. The language arts teacher believed that parents should be more involved in integrating real-world math into children's daily experiences. Teachers did not know that parents were integrating real-world math with their children's lives. Parents tried not to let their children know that they were testing their knowledge through real-world applications of math. This extension of math learning into the home gives SWD extra practice and time on math concepts.

Sub-Theme 2.5: Teachers Interpreted Structure as a Rigid Process but Parents Used It as a Guide

Rigidity of BAIP Process

Teachers attended several sessions where the BAIP model was explained and received documents on the recommended sequence in the BAIP research model. The BAIP research model recommended that teachers teach a lesson before sharing the accompanying parent activity that was consistent in content. This is then followed by responding to parent feedback after the parent activity is completed, if any. When asked to comment on the BAIP process, Mrs. Chelsea agreed with the process, noting that "homework is supposed to be practice" that reinforces what the teacher taught.

The other teachers had different perspectives that suggested they were not entire clear on the BAIP research model. The difference in understanding is focused on sequencing and free-will. Teachers felt that alignment referred to the coordination of school and home efforts in a structured and rigid manner, requiring parents to follow closely behind what teachers do. During her interview, Mrs. Joyce agreed that the parent activities were "very simple and it's a win at home" but she didn't think that it would "transfer in to school activities." She felt that students would not like the repetition and rigid need to re-do teaching at home. She also felt that BAIP should not be the entire curriculum, but one of the tools in teaching math.

> Like, "okay, you did that great but now let's do it again in this context." And you get kind of a glazed look saying, 'Well, I did that activity at home.' I'll say, 'but you didn't **master** the concept. You just did that activity at home.'

Mrs. Joyce said she loves the parent activity but felt that BAIP was "trying to create a new paradigm" where "everything is in alignment; parents follow up." She thought it was strange that

it is “sort of like a little cross between teaching traditionally and homeschooling.” The structure felt foreign and perhaps somewhat upsetting to the traditional format of teaching. She clarified that “all the kids have IEPs” at the private school and BAIP “is good to the extent that we can fit it into their IEPs, fit it into the lesson that they, you know, what they're working on. “ However, if the BAIP research model gets in the way of catering to the student’s needs then Mrs. Joyce thinks it is too rigid.

It was explained to Mrs. Joyce and Mr. Mark that it was not the intention of the program to set up such a rigid structure, but to allow parents to have the option of providing timely and appropriate help based on the same math concepts. Parent activities were meant to give SWD more time to practice after students are taught a new math concept and not for parents to take over the role of teaching new topics. This difference in perception of alignment may be an obstacle to success of the BAIP model as these perceptions may have detrimental effects on teachers’ willingness to use the resource over the long term.

Fidelity in Use of Parent Activities

Fidelity in the use of the activities refers to sticking to the scripted dialog or at least following the suggested sequence of activities. Mrs. Chelsea said she liked “the direct instruction piece to it a lot.” Based on her experience, she felt that many of her students need the repetition to “make sure that you are being thorough enough and covering everything.” However, Mr. Mark observed that “you don't know how kids are going to get to the parent piece.” Parents could use the lessons to engage with their students whereas some others would prefer to give their students access to the parent site for self-study purposes, just like Angela would. Mr. Mark explained, “maybe they don't get something, they get into an argument over how to do it and then they remember, ‘oh well, there's a parent thing online. You can click to download the

lesson.' And it could resolve the problem." The parent resource becomes an alternative reference point for students with the added bonus of being consistent with the lesson they were just taught. However, it could also invite trouble when parents refer to the parent activity but still insist on showing how they learned it. Mr. Mark commented, "Sometimes even teachers have taught students a math concept or a math idea in a way that I think was not really useful." He felt that parents would not follow the scripted dialog which would mean "you've just invited cross purposes with that student." He added, it "seems like parent involvement inherently is a good thing but it could be inviting a whole lot of problems too."

Teachers' fears were somewhat unfounded as parents mostly adhered to the script in the parent activities in terms of sequence. Tanya said she would follow the activities listed in the activity in sequence. She appreciated the scripted dialog because it was better than directions in traditional homework that said, "Go over fractions with your student." Okay? Well... exactly what do you mean? You know? Are we doing halves? Quarters?" Colin thought the scripted dialog was "very good. I mean, it helped me give an example, you know. A why we are doing this." The only thing Tanya would do differently "would be to review it first and know in advance [she's] going to have to figure out some substitutes. That it's not these specific things that [they] need [to complete the activities]." Marissa was the only parent who said she might not do all the activities that are repetitive of the same concept. Her son Miles learns really quickly so she would move on to a different concept. The other parents said they would keep to the sequence recommended in the parent activity though Gordon said, "I don't think I'd push her as long," "probably about 10 minutes." Most did use their own words to convey the concept in the suggested activities based on the understanding of their children. For instance, when Gordon was asked what he thought of the scripted dialog, he said it was "Redundant." He added, "I don't

know if I would have said any of those. I don't think I did. I didn't say much of that but I figure, once they get going, they figure out how to do it and they don't need too much prompting."

Parent Activity Feedback

Every parent activity ends with a short survey asking parents to rate the lesson and to input questions or feedback for the teacher. Gordon said "I would think everybody likes feedback" since "it would be good to give your views on it." Teachers however, took varying positions on the topic of feedback. All three teachers said they welcome feedback and have always been welcoming of it. Mr. Mark and Mrs. Joyce were more concerned than Mrs. Chelsea about the additional work the increased feedback would bring. Mr. Mark was concerned about the feedback system built into the end of each BAIP parent activity, "You've got 25 kids and 6 parents are concerned about their student's progress and... That means you have 6 parent contacts you have to make for the math program. That's a lot of work!" Marissa felt that the feedback option would "also be helpful for the teachers though, to know if things are not going well at home." For instance, communication would support parents informing teachers that they were having trouble with a practice concept.

Mrs. Joyce was worried that parents would provide feedback that was not constructive, and that felt like a chore to parents. She thought it would be "Really helpful for parents who are looking for a way to communicate with the [teacher]." She added that it should be "an option but not mandatory" and that "there should be feedback from parents all the time." On the flip side, she also wondered if she would be "getting feedback **all the time,**" which then becomes "just an additional responsibility and not necessarily a resource." Gordon said if the feedback screen popped-up, he would probably fill it out "as long as it wasn't too long."

Parents did not think they would leave feedback all the time and wondered if the feedback would be read. Colin thought the feedback option was a good idea as it would provide data to tell "whether [parent activities were] helpful or not." Julia hoped that feedback was taken seriously otherwise it felt like a possible waste of time.

> "I would hope that if it's asking for your feedback, that somebody's looking at it. And either assessing uh... the information given back to them or um... I would just. If that's not true then I would just assume that wastes... my time with it, if it's not going to be used to... to enhance."

Tanya felt that if she was "not hundred percent sure [she's] right about something, that feedback would be very helpful" as the teacher could clarify certain things for her. Parents would be able to see if their children need to meet with the teacher for extra sessions.

Unlike the other two teachers who had more experience teaching math, Mrs. Chelsea, an expert teacher in language arts, valued the feedback option. She appreciated the function as she had struggled to cater to all the needs in her diverse class. With great emphasis, she said, "I would have loved this in August when I was you know, trying to figure things out." In the semester before she tried BAIP, she wondered constantly about whether she was doing enough for each child; "Am I meeting the mark for this particular child? Am I covering everything I need to cover? Am I presenting it in a way that um, is logical, makes sense?" If she had had BAIP, the feedback option would have helped to answer some of those questions.

Summary

Teachers were wary about the structure of the BAIP process and felt that it could be too rigid and not afford themselves parents or any flexibility. They worried about fidelity and , the way parents use parent activities. Two teachers were also concerned that the two-way

communication function in BAIP would increase their workload and responsibility. Again, the Language Arts teacher had a different view from the two. It would seem that feedback is more appreciated by teachers with less experience teaching math.

Theme 3: BAIP as a Functional Parent Engagement Model

The BAIP parent resource was not originally designed based on Epstein's six frameworks of involvement (Epstein, 1995; Epstein & Salinas, 2004) and Hoover-Dempsey and Sandler (Hoover-Dempsey et al., 2005) framework of motivations for PI. Through this study, the BAIP Parent resource have shown that it can support the expanded definition of learning at home, i.e., encourage parents to participate in home learning activities that teaches school subjects in addition to encouraging, listening, reacting, praising, guiding, monitoring, and discussion. Epstein (1995) described a program as showing overlapping spheres of influence when students said that it helped them make sense of school work, and parents felt supported by the school. The Parent Activities provided content support and strategies for engaging children in real-world situations, which empowered parents to do more.

Epstein (1995) found that "just about all teachers and administrators would like to involve families, but many do not know how to go about it. (p. 703)" The same results were found in this study. Teachers were supportive of PI but did not have a clear or similar conceptualization of PI as parents did. BAIP showed indications of supporting overlapping spheres of influence that could clarify roles, tasks, and help develop a common understanding of PI. Parents felt supported and empowered by BAIP through increasing personal motivators like active role construction and strong self-efficacy for teaching math. Parents saw the sharing of parent activities as a clear invitation from the teacher to be involved. They also felt that the

simple activities provided concept refreshers with tasks that fit in with their family culture and that did not require too much time. Teachers did not have extra work to do, and students enjoyed bonding with parents and learning through real-world activities.

Overall, BAIP proved to be a functional model for engaging parents. It supports the expanded definition of learning at home and utilized the recommended processes for increasing PI. In addition, BAIP acts as the bridge between theory and application and makes clear parents' and teachers' conceptualization of PI in terms of roles and responsibilities. Selected parent-child cases are shared to show that the BAIP process adheres to the Hoover-Dempsey and Sandler theoretical framework and supports the extended definition of learning at home.

Sub-Theme 3.1: BAIP Adhered to Hoover-Dempsey Framework

The BAIP parent resource supports the first three levels of the Hoover-Dempsey and Sandler framework and evidence from interviews and observations supported that design. It supports active parental role construction through facilitating positive PI experiences, improved perceptions of engaging with one's child in math, and scaffolds for further PI in home instruction. It also sends explicit invitations to parents to be involved in students' math instruction.

Level one of the Hoover-Dempsey and Sandler framework refers to variables like personal motivators, parents' perception of contextual invitations to involvement, and school or program responsiveness to family life context that influences the parental decision to be involved.

Personal motivators take account of parental role construction for involvement and parental efficacy for helping the student succeed. Parental role construction is a sense of personal or shared responsibility for the child's educational success and whether one should be engaged in supporting that success as well as the child's learning (Hoover-Dempsey et al., 2005). As discussed in Sub-Theme 1.1, the home-school responsibility partnership, BAIP supports positive

parental role construction through facilitating positive PI experiences, improved perceptions of engaging with one's child in math, and scaffolds for further PI in home instruction. Parents believed they should provide additional support for their children and will be involved in ways informed by personal experiences and beliefs. The degree and form of involvement varied across parents because of differing prior experiences, but the variability diminished across parents after using the BAIP parent activity. Parents reported an increase in confidence, and perceived assisting children as something they can continue or begin to do. All parents felt they could provide home instruction and were as confident, if not more, after engaging in the BAIP parent resource. Parents were always ready to get involved when needed; or even more involved to give their children more practice time.

Parents and students felt that the parent activity, including the Teachable Moments and Structured Activities, they engaged in were easy to execute. Marissa, Jason, and Angela praised the activity as being really easy to use, "a very simple activity." Angela said, "This was easy. I was talking about how painful it was before and frustrated it was. This was easy. I can do this." She added that it was so easy to use that she could see herself doing it, "there's no way for [her] to get frustrated with it." Tanya agreed that it was easy as she "didn't need to learn anything new in terms of math concepts." Tanya reported that after engaging in the parent activity with her son Trent, she "[felt] more empowered." The increased sense of power came from knowing that her student was "coming home with something [she knew]" and "that would tie in to whatever they did at school more than just a list." For instance, "we're learning number lines" would not tell her very much and she would have "to start from scratch." After her experience with the parent activity, she said she was "Okay with what was here" and didn't find [that she] needed other resources" even though she knew "that there are some available on the [parent site]. However,

with the “resource right there, it tells [her]” what the homework is about, ideas for activities, and even what to say, which reduces her preparation workload. To Tanya, the empowerment also came from the resource being a “point where you can start as opposed to you have to build it before you can use it.” Even though she would have “to change some things [to customize it for Trent], it was still ‘okay, I get this.’” Tanya said she could “see the benefit in doing more as a parent” but “if we were 80-20 before, [the school would be] still 80 but I might be 30. So we've gone above that threshold.”

Julia described the BAIP parent resource as “a great great tool” and said she “would be very much involved” using the BAIP parent activities so that they could “have a better understanding of what [Jason] was actually trying to do and see it.” Even Mrs. Chelsea wished “[she] had had that as a parent.”

Parents vary in level of comfort in teaching math. Tanya was asked how she would cope with teaching her least favorite topic, geometry, and responded positively. The resource felt accessible and gave her confidence in its depth of coverage and support of parental home instruction. Tanya recollected her negative math experience, “I didn't connect with my teacher and hated it, never understood it.” However, she felt that it “doesn't mean it's not possible” for her to help Trent with his homework. “So yes, with the resources and all. If I had to go Google and find out? Maybe I’d find some resources maybe not but it would be helpful to know exactly where I could go. Here's the encyclopedia of math or whatever, you know. Tapped resources. So I think I could.” Tanya was naturally comfortable teaching Trent but was further empowered after experiencing BAIP.

> Well, I would say I feel more empowered. You know, if they're coming home with something I know... you know, I know would be helpful, that would tie in to whatever

> they did at school more than just a list of 'we're learning number lines.' And then I'm thinking... okay well, you know, having to start from scratch. You know, I've got the resource right there. It tells me. You know that little script. And even though I had to change some things, it was still 'okay I get this.' So... again it's... it's a resource. It's something. It's a point where you can start as opposed to you have to build it before you can use it. (Tanya)

Being further empowered, parents may choose to play more active roles to positively influence their students emotionally and academically. Mrs. Chelsea noted that the availability of the parent activity script will "aid [parents] with explanation, particularly if their son or daughter says, 'I don't get that. I don't get that.'" The ability to help, "being able to have some tools to refer to you know, brush up on it, even on the quick" can be "really critical because I think it will reduce the amount of [anxiety] and some incomplete homework and things like that." Mrs. Chelsea observed that giving parents the opportunity to learn from the lessons may reduce the number of notes sent to the teacher where parents say, "I didn't understand this and I couldn't explain this to [my student]." Mrs. Joyce recalled her partnership with Craig's father, Colin, and noted that though Colin knew how to teach Craig, it was "not the way, obviously [how she] may have been teaching it." She thought it interesting that "actually, Colin [wouldn't] know if [she was] teaching it differently [because] a lot of the time, students will say, 'that's not the way she did it' and it's **exactly** the way [she] did it." Knowing that the parent was using the same method consistent with what was taught in school would help to resolve such occasions of dispute between the parent and child.

General invitations from the school or program, and specific invitations from teachers and students served to remind parents that they are an important part of the responsibility

partnership. Parents appreciated invitations as none of them had ever received any to be so academically involved.

Tanya's BAIP experience was the first school invitation she had ever received. She said she would be willing to do more of these activities if the system or teachers could make her accountable or send her reminders that newly assigned BAIP parent activities are available. Several parents said that they would do whatever the school asks them to. Gordon said he would "help whenever they [needed] help." Being held accountable also motivated parents to be move involved. A reminder e-mail to inform parents of new lessons would help parents feel accountable without having to "remember to go in and check" randomly. Tanya explained the rationale of accountability increasing PI.

> I believe I would if I got the little email. I'm good at doing what I'm told. If I got an email that says time to go click on this link, I would do it. If it's up to me to remember to do it, [then] maybe, maybe not. There needs to be some sort of, for me, I work best if there's some sort of deadline. So if somebody said do this, this is the week, [and] you do this during this week. I work well with a deadline and I work well with um... verification. Somebody checking. If somebody's going to check to see whether I got it done, I'm more likely to do it. But if it's just 'you know, here's some resources if you want' then you know, if I've got time, I will. (Tanya)

Family life context variables are composed of parental subject knowledge and skills, parental time and energy, and family culture. Many parents like Marissa, Tanya, Julia, and Colin enjoyed the teachable moments as it reflected what they have already been doing but with more support. They appreciated the fact that they did not have to come up with ideas from scratch, saving both time and effort. Creating engaging activities requires a lot more time and effort than

what working parents can afford. When Marissa was homeschooling Miles, she said “it was constantly finding activities, taking out books, trying to think of ways to enrich this kid with this voracious appetite for numbers. It was hard. It was really hard.”

Also, BAIP parent activities were designed to be refreshers so the parent would not have to teach brand new information.

> I didn't have to start from scratch with her. She already knew how to do the fractions and the whole numbers and get the common denominators and all that. She's able to refresh me even though I had the sheet to refresh me. And I went through all that. By the time I got with her, I still needed more refreshing. And she was able to do that 'cause she had already learned that portion of it. (Angela)

The parent activity included both formal and informal activities to cater to different family preferences. Many liked the informal teachable moments for its ease. Colin described it as “more laid back. I mean in, [Craig] seems to be more at ease” as compared to when he was working on the structured activities. For others like Julia, the structured activities provided the procedural and conceptual knowledge that she needed.

> [The teachable moments] took a little bit more accountability um that you knew your stuff. There was no answer provided. Right immediately like it's like right or wrong. If I would have changed the numbers we used, then I would... and he answered the question, I wouldn't have known if he was right or wrong. So there wouldn't have been that satisfaction of saying, “yes, that's a good job. You got it!” I would have just had to... know. If I didn't know the answer already, then I would have to assume he was getting it right. (Julia)

Level Two criteria on the Hoover-Dempsey and Sandler Framework are built into the language and design of activities. The structured activities provide instructional scripts suggesting ways for parents to model understanding and application of math concepts as well as persistence in working through math problems; reinforce student learning with personal stories and examples that appealed to the student, and include encouraging comments. The same variables mediate student perception of learning mechanisms engaged by parents.

Parents used the script to demonstrate or explain concepts. Their behavior during the observation showed that they paid great attention to the structured activities. Tanya would keep her finger on the activity sheet to ensure she followed it through as recommended. Colin and Julia read the instructions out loud to help their students keep up with the activity. Marissa and Angela did not go through the lessons word for word but always checked to be sure that they did the activities in the right sequence. Even though Gordon did not use much of the script verbatim, whatever he practiced with Gwen was suggested in the lesson. The time that he chose to go off script to incorporate coins into an activity differently, was the one time that Gwen did not understand what was requested of her.

Gordon (**Father**): Here, let's do these. This one and that one. [Points out 2 coins, both quarters.] That's two and a half.

Gwen (**Student**): What? [Looks at Gordon, confused look. Eye contact made.]

Gordon: 2 and a half. 2.5. You actually have to do math. Write it down.

Gwen: Ungh... [groans]

Gordon: Ungh [mimics Gwen]

[Gwen shakes her head and pretends to stab the working paper with her pen then frowns.]

Gwen: I don't get this.

Gordon: What do you mean you don't get this? We've been doing it.

Gwen: I don't get with the money. [Gwen frowns, pouts and pushes the money away]

Gordon: Alright well then let's do a 10 and a 5. [Pushes the coins in front of Gwen]

When he switched back to the structure that she was used to, she managed to get back on track but was visibly frustrated and distracted.

During the observation, parents were prompted by the script to encourage their students, to which they all did. Tanya would commend Trent for getting answers right, "Good job! That's exactly right, Trent!" and Marissa would keep Miles engaged by saying, "Good! Okay, well done. We'll keep going here." Parents also used the scripts to check students' thinking process. Julia was pleasantly surprised when Jason got the answer very quickly to a word problem. "Yep, you're right. That's the largest number of cookies you can put in each bag. I can put 4... How did you know that? Great job!"

Summary

The BAIP parent resource helps to clarify the role of the parent and teacher in the relationship partnership, engages and empowers parents to increase involvement, or to make involvement more effective. The BAIP model supports levels one and two of the Hoover-Dempsey and Sandler model of PI. It is supportive of active parental role construction and is an excellent parental tool for providing home instruction.

Sub-Theme 3.2: BAIP Supported Learning at Home

BAIP parent activities encouraged parents to participate in home learning activities. All six parents reported teaching their children how to apply math in the real-world in their own ways. Not academically motivated, these real-world lessons were meant to help children cope and function in real life. The Structured Activities helped some parents realize the extent to

which math as an academic subject, could be incorporated into the real-world. Marissa said that the BAIP Structured Activities were “Awesome. It's stuff that's just lying around the house and um, it actually is real life applications. Like check it out, there's a 30% off sale at Kohl’s. You know. Instead of some random, you know, Sally bought 500 cantaloupes.” Parents appreciated the activities because it mirrored the type of learning activities they already do at home, but provides them with even more game ideas and math connections. For instance, Gordon learned that math is needed when one doubles a recipe or when using measuring cups. It was also useful feedback to parents to hear their children describe what they learned. Amber said she “learned a little bit about um how we use fractions in everyday life... a lot.” She reached out across the table to pick up some measuring cups and spoons and explicated a concept that was useful in baking, “You know, we like, take one fourth of a cup, okay. If you have like, you got two fourths, which is like half of this (shows a cup), you know. Or, like two of these (shows quarter cup) is equal to one of these (shows half cup), you know.” Her mother, Angela, was very proud of her performance during the parent-child school session.

Parents were asked to rate their comfort level on a scale of 1 (low) to 5 (high) in teaching their children math before and after the observation. Three parents experienced gains in comfort level after their experience with the BAIP structured activities. Comfort levels maintained high or increased after engaging in the BAIP parent activity with their children. Three parents did not experience gains or drops in comfort level as they felt that what the parent activity provided was similar to what they have experienced at home when they did provide homework assistance. However, they said that having the BAIP parent resource was still empowering as they could do as much if not more with less time spent on researching resources on the internet. Overall, all 6 parents appeared empowered and were competent home instructors with the resource (*Figure 5*).

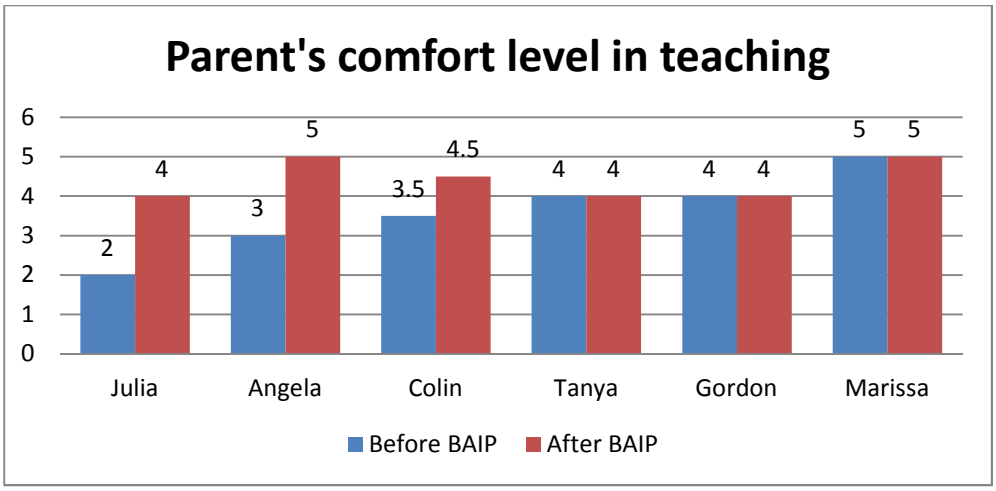

***Figure 5*:** Parent self-reported comfort level in teaching

The six cases are described in detail in Appendix XII to illustrate how parents interacted with their children when engaged in BAIP Parent Activities. Julia felt that the BAIP parent activity "was much better" than any other math experiences that she has ever had as it gave her structure and needed math refreshers. These parent-child school sessions led to a sense of empowerment and feeling of competence when providing home instruction.

Summary

Parents felt empowered after engaging in the BAIP parent activities with their children. Parents who had prior negative experiences providing instructional support, or who were not confident providing instructional support, or who felt they learned math differently, said the BAIP parent resource helped to allay some of those fears. Parents who were more comfortable providing instructional support felt that the activities reinforced what they did at home. During the observation, all parents demonstrated the ability to support learning at home by encouraging, listening, reacting, praising, guiding, monitoring, and discussing with students, and teaching school subjects.

Sub-Theme 3.3: Benefits of A Consistent Set of Resources

Having a parent resource that is consistent with standards and classroom instruction provided parents with timely information and resources to stay up to date and provide needed help. Julia described the consistency across resources as being "very key to understanding what was going on at school" from the parent's point of view. Trent's mother, Tanya agreed profusely with Julia, "Oh absolutely! Absolutely, because it lets us keep our finger on the pulse of what's going on at school. And how he's doing. For the child, Julia noted that the consistency meant "coming home to see [the same concepts] and [getting] more practice and kinda make it fun for practice too." Having had prior negative experiences with late communication, Julia felt that she would be able to help a lot more if she was "able to understand what's going on in the classroom and then bring that same concept home." She posited that it was "very important for the teachers to teach the same things that they're working on at home" and would be "key to anyone, any child's success."

Parents Get First Hand Information on Student Progress

Julia felt that having "access to something like [BAIP Parent activities] on a daily basis, and whatever [Jason] was taught at school that day could be continued at home that night, even if it was just a session every night of the week for just a few minutes, I think that he would be very successful in math. Just even if it was a concept over a week that he could practice and work with. I think it'd be very, very good." She noted that if they "would do this on a regular basis, [she and her husband] would be very much involved and have a better understanding of what [Jason] was actually trying to do, and see it."

Colin added that working on activities with his son, Craig, that are coordinated with classroom instruction and math standards, helped him understand his child's progress and what

the school was doing. He felt that the additional, coordinated practice at home "seals the point home more" and "gives it a little more confirmation on whether they're learning [the math] or not." Teachers like Mr. Mark agreed with parents that the alignment would provide good feedback for parents so they "can see how well their kids are performing." He said it was a "good communication tool, yeah. Parents can see right away what their kids are capable of or not capable of or needing help on." Mr. Mark recalled sending some practice sums home for a parent to work on with her student and she told him, "I know my son knows all those things. He's had those before. I even taught him some of those things. I know he knows them." However, Mr. Mark knew that the student had forgotten the concepts and needed more practice. He advised the parent that "he doesn't really know till he can show you he knows them." The parent activity provided that very avenue for students to demonstrate understanding of what teachers have taught. Parents need not wait for teacher-parent meetings or difficult homework sessions to realize that their students needed help. As Colin said, "we'd know what [the teacher's] actually going over in school" and then provide timely and appropriate help. Parent being part of the information loop will be beneficial for struggling learners' academic growth as parents are better equipped to track their progress and learning needs.

Reduces Student Confusion

When instruction was coordinated as a whole, struggling learners faced consistent vocabulary and teaching strategies in school and at home. This reduced the cognitive dissonance that came from parents learning and teaching math a different way than students were taught in school. Aligned resources helped parents keep up to date with current educational approaches for teaching math, and even learned new math terms for old concepts. Continuous home-school support is beneficial for the child's learning (Ascher, 1988).

Gordon could not emphasize enough the importance of consistency in instruction both at home and in school. His daughter Gwen suffered from a lack of consistency in instruction and had very negative public schooling experiences. However, Gordon said he and his wife "didn't step in very much because how they [were taught math] was different than how they teach today." They hired a tutor for Gwen but it did not make a big difference as the tutor was "trying to teach on her level and the school was trying to teach on their level. Gordon said that "everybody [was] teaching her something different." and that was "pretty much how it was most of the time even though [they] went to argue and fight all the time to get everything on the same page." Only once, in third grade, did Gwen have some semblance of consistency in instruction both at home and in school, which contributed to positive growth. Gordon recalled "that everybody got along and the tutor actually picked out the spelling words. [The tutor] pretty much picked out the whole curriculum" and "told the teacher what to teach." He remembered that "they all tried to do everything exactly the same. And that year, [Gwen] actually did go up a little bit." However, that arrangement did not continue when Gwen moved up a grade. The tutor would email Gwen's new teachers but few would respond. The situation "went back to the way it was where everybody weren't on the same page and Gwen was with them. She took a nose dive that year. She went from like third grade to first grade level that year."

When asked about the consistency in BAIP, Gordon thought it "would work fine." He lamented that Gwen would have learned more if teachers had used this model with the tutor they hired. Gordon commented that using this model "would help stick it in better, that's for sure. Make everybody work on the same page." Removing the confusion through coordinating home and school instructional support would provide a united front that aids student learning.

Parents, Teachers, and Students Share Common Vocabulary

Alignment in standards and instructional approaches was also designed in to the math dictionary. This was very helpful for a number of the parents who professed to going through a somewhat different math education. Amber's mother, Angela, said that the way she "learned the math is not the way [Amber's] learning it now" and so if she tried to help, Amber "gets frustrated too as well." Julia said that math "is so different than it was twenty years ago. How they teach children how to um... problem solve." She knew that most parents could solve the math problems but would be concerned that "they're teaching it a different way than the teachers are." Students in this situation, like Amber and Craig, commonly complain, "That's not the way the teacher said to do it." Angela felt that " that's the way [she] know[s] how to do it, and it's going to get the same answer" but if it really frustrates Amber, then she would prefer to "work with the teacher. Let's go in before school or whatever. But we could use the resource." While using the BAIP parent Structured Activity during the observation, Colin found the math terms in the activity foreign. With regards to the term "greatest common factor", he said, "I have a little problem with it myself. Because they didn't call it that when I was in school." The term that he used in school was "greatest common denominator." Like Colin, Julia felt that "the concepts were the same [as what she] was learning in college but it was just presented in a different manner than what it was in, in school." Even though Colin was faced with new terms, he became "real comfortable with it" once he understood it. He explained that he "might know what it is but it's called something different."

Interestingly, Mrs. Joyce mentioned that parents wouldn't know if she was teaching differently or not. She remarked, "A lot of the time, students will say, 'that's not the way she did it' and it's exactly the way I did it." Having the parent resource aligned to classroom instruction would provide parents with reassurances that the methods they were trying to teach would either

arrive at the same solution, or was the same strategy that the teacher was using. Parents appreciated the alignment and Structured Activity experience, and found future use of the model very promising. Angela said, “This was so easy that I can see me doing it 'cause there, there's no way for me to get frustrated with it.” Also, since the home activities are just practices of what was learned in school, it makes home support a little easier. Angela added, “'Cause she already knows it, basically. And it's just giving her a little more... I'm not teaching her, I’m guiding her through something that she already knows.”

The BAIP parent activity also provided parents with concept refreshers that were not available in traditional homework. Parents shared that given the option; they would refer to the resource when helping with homework and even pick up quick refreshers of forgotten concepts before helping with homework. Tanya noted that if her son Trent were to come “home with something [she knew],” it would be helpful especially if it “would tie in to whatever they did at school more than just a list of ‘we're learning number lines.’” Julia recalled that Jason had oftentimes gone home with a lesson that used “a new method of teaching or just a new concept” and they were “not familiar with it at home.” Julia turned to Jason with a laugh and said, “Like we don't know what you're talking about because it's so different than what we learned. And I’m old.” For Julia, an aligned resource with detailed directions for parents would be “very important” to her. Accessing tools that are aligned with standards and classroom instruction would support parents who wish to provide struggling learners additional support that children are familiar with.

Summary

Parents liked resources for supporting learning at home that was complementary to teacher resources so that they may get firsthand information on how their children are progressing in math. When curriculum is coordinated to be consistent both at home and in school

by content focus, timely support at home will help reduce student confusion. Parents are also able to speak to children in the same math language that teachers use. Students and parents often felt that parents used different strategies to solve math problems but teachers felt that there was often no real difference. The BAIP parent activity helps to keep parents up to date on student performance, provide scripted dialog to give parents refreshers on math concepts, and shares strategies that teachers use. Parents and children appreciated the alignment and suggested that BAIP parent activities replace traditional homework.

Sub-Theme 3.4: BAIP Improvements Suggested By Parents and Students

Parents and their children had much to say about the BAIP parent resource after engaging in Teachable Moments at home and Structured Activities in school. Teachers did not have much to comment on the BAIP parent resource as they did not look into them in detail. Parents felt that the resource was good, had appropriate language and good real-world activities for teaching concepts. They felt that it had room for improvement in teaching and engaging parents in using the resource, could have more supports for students with reading disabilities, and wanted more interactive material as well as visual aids to improve engagement.

More Challenging Problems

The activities were relatively easy for students who were better at math. Amber said her activity was "fairly easy." Amber made a novel suggestion, one that I had not considered, that "instead of giving [her] homework, [she] could do like an activity on [BAIP] for like homework." She commented that the activities would be better if there were "more challenging fractions or something. Not like too hard like it's insane, you know. But like, and also if you added like more games or something you know like to make you learn. I like this type of games. Unless you're like really really really bad." She liked that the activity used games to practice

math concepts and she said, “I’m half between the dice and the playing card. I think I like the dice a little bit more because it was a little bit easier you know. Easier like to understand.”

Students such as Trent felt that the activity he worked on was “pretty easy” and “it didn't take too long so it didn't seem like it was too much of a burden on [him].” He explained that “it wasn't too hard. It felt like [he] could just do it pretty quick. Um... but it wasn't too easy like one plus one or any of that.” Trent’s mother, Tanya, overheard her son saying that he thought “it was easy” and she felt that there has to be “a fine line between getting to the challenge without feeling overwhelmed.” The lesson that Tanya and Trent did was indeed too simple for the student as the teacher had shared the wrong parent activity. The error was only discovered just before the observation was due to begin when I saw that the printout the parent brought was different from mine. I decided not to alert the parent to the error so as not to negate her preparation efforts and Teachable Moment section of the parent activity. Tanya said, “I don’t know that [Trent] was challenged by this, which is again, I mean, you would have to do several [activities] to find out where he is.”

I observed that Trent got bored or distracted easily and he kept himself engaged by fidgeting, pulling on his shoelaces, or making whatever he’s working on, more complicated than it needed to be. Tanya said Trent was doing a word problem the day before and it read, “Mr. Carver... something or other. He totally changed it to Mrs. Gavindorf or something crazy. And then he had to remember the different pronouns.” Tanya felt that he was distracting himself as it was an easy name and did not need complicating. She wanted him to move on to actually solving the math problem but “he wanted to make it more complicated and it really had nothing to do with the problem,” which resulted in a little argument.

Miles said “it was too easy and therefore boring” for him. He recalled the lesson he had with Mr. Mark and made suggestions on how to increase the challenge, such as using different numbers with no repetition of the same pairs.

> Like, I kinda was handed a sheet with all the slides on it? On the two different slides, they had the exact same um... um... the numbers except that one of them was the answers and one of them wasn't. But it wasn't actually meant to be the answer key. It was just... like hold on, like it was like find three-five. Like turn 35% into a fraction and a decimal. And then turn this (writes 0.35) into, into a percent. And that was a little like, hmmm? (Miles)

Although this was not evident in Miles’ Parent activity, it was observed in Gwen’s activity where she was tasked to manipulate the same numbers to create math facts. If Miles had had Gwen’s activity, he would have had trouble concentrating. He confessed, “I don’t want to go over it for like the next forty minutes because honestly, then you start losing me. Then I’m thinking about, ‘Ooh what am I going to do tonight? Ooh, what am I going to be eating? Ooh, I like waffles. Ooh!”

The other parents and students felt that the activities were not too difficult and some were appreciative that they did not take too long to complete. Jason’s mother, Julia, commented, “the best thing about it, is that it didn’t take very long.” She attributed this to having gone through the Teachable Moments prior to the Structured Activities. Craig’s father, Colin, agreed with Julia and said “it helped [Craig] yesterday when [they] just talked about it and he went right through it.” That helped him to feel better about the Structured Activities “after [they] did the Teachable Moments first.”

Engagement Was A Challenge

All parents completed the activities without too much trouble but a few confessed in the post-observation interview that the experience was challenging and stressful. Tanya said that "these were really great ways to teach kids to flip between fractions and decimals and percentages" and "the activities were spot on in teaching the concepts." However, "it was difficult to spice it up enough to keep [Trent] engaged." Colin could sense his son's attention drifting as the activity progressed. He appeared anxious during the observation as he did not know the reason why Craig was distracted.

> Well, when we first started doing the multiples, I felt like he was, he was really trying to pay attention to what we were doing. But then the more that we did them, I felt like he was getting frustrated and wasn't really listening the way that he should have. I don't know whether he was frustrated because... he just didn't want to be here or he was frustrated because he didn't understand. (Colin)

Marissa faced the same challenge of trying to keep Miles engaged. She found her "brain spinning quickly to figure out ways to keep up with Miles and keep him engaged." Looking back at it, she thought it started off okay, "sort of neutral on the whole thing" but Miles, being a really good math student, made it challenging for Marissa to keep up with him. She tried her best and "while [she's] talking to him, behind the scenes, [her] wheels are turning." She asked herself how she could make it more interesting, what else she could say "so that he's not completely gone."

More Visual Aids

Several parents and students commented that more visual aids would be in line with their teaching and learning preferences. Mrs. Joyce said that Jason is "more visual" and he "likes

manipulatives." Jason admitted that more pictures in the parent activity "could probably help a little bit more" as he has reading challenges. Colin said it would help if they had "something to draw on" since he talks with his hands a lot. His son Craig, mentioned that he was used to working on a whiteboard just like he does in Mrs. Joyce's class. Angela said that she is a "visual person so it's easier if it's animated for" her than having to read a paragraph. Long instructions are challenging for her and she had to read through them several times. If the instructions could be shortened or animated into a video, it would save her from some frustration. Marissa also suggested video examples for visual learners as an alternative.

> The only thing that I can think of that might help folks is to have examples of. So for example, here's an activity that we want you to do. And then show either cartoon characters or real people, doing that activity. You know, roll the dice. Oh look, "a 2 and a 5. Because the 2 is the smaller number, it goes on top. Because the 5 is the bigger number, it goes on the bottom. Now what we're going to do is we're going to...." So that for people who learn more visually instead of reading could say, "Oh! That's what we're doing." Like maybe, those folks. So that it was more of a multisensory type experience for parents as well. 'Cause you can't be... guaranteed that while I love to learn reading, reading is my preferred form of educating myself. That's not true for everybody. (Marissa)

Apart from videos, parents, teachers, and students all wanted a screen reader or audio option for students with reading difficulties.

Summary

Students who were better at math wanted problems that were more challenging and did not want repetitive work. Students got bored quickly if questions were too simple or repetitive,

which also makes it difficult for parents to keep them engaged and on task. Due to the special needs of the students, more visual aids were requested multiple times. Suggestions included replacing text with visual representations or having both. Parents suggested screen readers for poor readers, and favored equipment like white boards for Structured Activities. Use of the white board allows students to feel like they are doing hands-on work in the classroom.

Conclusion

BAIP as an Emerging Partnership Model

Data from the study suggests that BAIP could be the bridge between theory and application as it helps to clarify roles and expectations. The model supports all four elements in Swap's Partnership Model and extended learning at home to include instructional support as well as establish a broader model of parent engagement. Two goals and assumptions that support success in establishing a partnership model are (a) restructuring of the school environment, new policies and practices, structures, member roles, relationships, and attitudes to support the partnership; and (b) collaboration among members to set up and maintain the partnership. This will be discussed in further detail in Chapter 5.

Chapter 5: Discussion and Future Research

Summary of Major Themes

This study was designed to examine the experiences and perceptions of teachers, parents, and students in the process of engaging parents with their students in an instructional support role outside of the school. A total of six triads comprising of six parents, six students and three teachers, who each served on two triads, were asked to engage in the Blended Assessment with Instruction Program (BAIP) math resources. Two students from each teacher's class and their parents were invited to be involved as study participants. Findings described how parents were engaged in the parent involvement (PI) process. This provided insights into the school-home environment. The BAIP proved to be a functional parent engagement model. However, through the use of the BAIP, dissimilar perceptions of PI and incongruent requirements of parent resource among parents and teachers appeared to hamper the development of a partnership model. The three major findings are shared below.

Theme 1: Parents and Teachers Perceived PI Differently

On the surface, it seemed that parents and teachers were in agreement that PI was beneficial, and any intervention used to support or enhance academic performance of SWD would immediately be accepted and be able to begin successfully. Parents perceived PI to be necessary and something that they already do at home. This is based on past experiences of a lack in home-school partnerships, faced inadequate support from public schools, one-way or delayed communication, no invitations to be involved, and school's low expectations of children. Parent's perceptions of effectiveness of PI were also affected by home factors such as availability of parent, parent-child connection, and a lack of homework support from the school.

Teachers' past experiences in the public and private school system resulted in low expectations of parents being able to provide instructional support, and beliefs in responsibility for teaching that skewed towards teachers being more responsible. There is a need for parents and teachers to understand how each other perceives PI. Lack of such dialog encourages separate spheres of influence, where teachers and parents try not to let their respective roles overlap, what Swap (1993) would term a "protective model." Epstein (1995) described separate spheres of influence when teachers think, "If the family would just do its job, we could do our job" and parents who say, "I raised this child; now it is your job to educate her. (p. 702)" Overall, it seemed that teachers in this study were not entirely ready for active PI.

Theme 2: Parents and Teachers Have Different Requirements of Parent Resources

This difference in perception of PI resulted in different views of what parent resources were needed in this study. Teachers thought of the parent resource as an informative tool with parent activities that could replace homework. Parent activities would be used only when parents volunteered to use them. Parents wanted the parent activity to be a requirement or standard practice acknowledged by the school so that they could make it a habitual activity. Parents believed that working on parent activities facilitates bonding between parents and children. Teachers underestimated parents' funds of knowledge (i.e., ability to teach and understanding of informal teachable moments) and may not have been aware that parents provided students with real-world math practice. Teachers were also worried that the BAIP process was too rigidly structured for parents but the worry was unfounded and parents did not think fidelity of the parent activities was a problem. In fact, parents liked having a guided sequence to follow. One parent even described herself as being very good at following rules. Teachers and parents

appreciated feedback. However, teachers were unnecessarily concerned that parents would feel obligated to send feedback even when it was not necessary.

Theme 3: BAIP as a Functional Parent Engagement Model

The BAIP parent activity showed that it could support the expanded definition of learning at home, i.e., encourage parents to participate in home learning activities that teach school subjects in addition to encouraging, listening, reacting, praising, guiding, monitoring, and discussion. The BAIP parent resource supports the first three levels of the Hoover-Dempsey and Sandler model. It can increase parental motivation to be involved by building parent role construction and increasing parent efficacy. The BAIP parent resource supports school, teacher, and student invitations. It is also sensitive to family life contexts through the provision of scripted dialogs to give lesson refreshers, has a variety of short and long activities, and activities mirror what parents already do. The BAIP parent activity enables parents to use various learning mechanisms to support student learning, including encouragement, modeling, reinforcement, and instruction. The BAIP parent activity effectively supports the extended definition of learning at home and empowered parents after they engaged in the parent activities with their children.

The BAIP parent resource kept parents up to date on student performance and informed parents of concepts that children are taught in class. The parent activity provided scripted dialog to give parents refreshers on recently taught math concepts, and shared strategies that teachers used in class to reduce student confusion. Parents and children appreciated the consistency in instruction both in school and at home (i.e., alignment) and suggested that the activities replace traditional homework. To further enhance the BAIP and address children's special needs, parents and students asked for more challenging and engaging activities with greater use of visual aids.

This included replacing text with visual representations or having both text and video options built in; building in audio or enabling screen readers for poor readers, and using white boards for hands-on activities that mirrored classroom activities.

Implications of Theoretical Frameworks

Two theoretical models, Epstein's (1998) six types of PI and Hoover-Dempsey and Sandler's motivations for PI, were originally used to guide this study. As the study progressed, it became apparent that PI at the private school could benefit from more structure. Thus, Swap's theory of home-school partnership, was examined to help establish a broader model of parent engagement. Epstein's theory looked at the types of involvement whereas Hoover-Dempsey and Sandler's (2005) looked at the process for engaging parents. The emergent model was compared to Swap's (1993) partnership model and found that BAIP could support the broader elements of engaging parents through 2-way communication, enhanced learning at home, facilitated mutual support and joint decision making, which could lead to partnerships that reform schools.

What this study discovered was that addressing the needs of parents and recommending activities was not enough to successfully maintain a PI program. An unexpected obstacle was the lack of a common perception of PI and parent resource between parents and teachers. For an actual, functional, and mutually appreciative partnership to be forged, teachers and parents need to agree on a definition of PI and learning at home before taking steps to implement and maintain a PI program.

Teachers and parents in the study may be unaware that they have been subscribing to a curriculum enrichment model sometimes and a partnership model at other times. A curriculum enrichment model is one where parents are involved in school-related events that teachers felt

were within parents' comfort zones – volunteering, fund raisers, etc. The curriculum enrichment model does not involve parents as instructors whereas the partnership model requires parents to be more involved, such as making decisions and providing instructional support at home. An example of partnership at the private school is of Mr. Mark working with his students' parents on distributed practice worksheets. Parents provide instructional support at home and create new practice problems for children after consulting with Mr. Mark. Not all teachers and parents have such comfortable working relationships. More can be done at the private school to get parents even more involved in similar ways that would support individual teachers. Students will benefit from additional time on task and parent interaction and parents are willing to be more involved but need a structure within which to work with. For instance, Tanya said, "I still want the school doing as much as they're doing and [parents are] adding on to it instead of taking away some [of that support]." There is evidence of an emerging partnership model that brings to light the disparity in values and perceptions of PI in the private school. Referencing Swap's partnership framework, there is a need for a broader model of parent engagement which includes making joint decisions on selecting PI programs, communicating about roles and expectations, mutual support, enhance learning both at home and in school. BAIP appears capable of facilitating these elements of a partnership.

BAIP as an Emerging Partnership Model

To bridge theory and application in support of a long term and comprehensive PI model, parents and teachers who are directly associated with a student need to talk about synchronizing perceptions of PI. If parents were involved at the decision making level on programs such as the BAIP, it could facilitate the discussion of PI. This could lead to providing parents and teachers

with options for differentiated levels of PI to suit parental needs and family contexts. The following section describes how a PI program like BAIP can be utilized to support an emerging partnership model.

Make Joint Decisions

Schools should include parents in decision making at the district or school level, especially when it is about a PI program that affects students' academic achievement. Before adopting BAIP at the classroom level, schools and families need to be upfront about expectations, individual roles as participants in the program, and individual needs (see Themes 1 and 2). This will synchronize teacher and parent conceptualization of PI and resource requirements. Teachers will be aware of what parents are contributing to students' learning at home and can provide the necessary resources. When parents provide input on students' performance and practice at home, both parties can work towards an array of solutions for helping the student deal with distraction, learning strategies, and even selecting technology accommodations. For instance, at the individual child level, Gordon and Mrs. Chelsea could come to a compromise on the use of calculators. Gordon thinks the technology is "cheating" but Mrs. Chelsea felt that it would speed up Gwen's calculation skills so she can move on to more advanced math. Gordon's practice of having Gwen write out her times tables each time she needs to calculate multiplication problems could be preventing her from memorizing her math facts.

If Mrs. Chelsea was aware of the practice and Gordon was made aware of how important it was, they could brainstorm strategies to help Gwen memorize math facts. Mrs. Chelsea could then provide the supports or resources and Gordon could enforce the practices at home. Making such decisions jointly provides a consistent approach to teaching Gwen, which like her tutoring experience, will bring about marked growth in learning and achievement. This is consistent with

the literature that teacher invitations to be involved in homework should coincide with parental desire to know more about how to support their children's learning (Epstein et al., 2001). In addition, parents generally need specific suggestions about how they can help at home (Guskey et al., 2006).

Facilitates Mutual Support

Once teachers and parents share an understanding of what PI means to both parties, it will be clear how much parents are willing to be involved, what they are comfortable doing, and how much they can do. The sharing of parent resource clarify activities that are valued by the school and which help SWD gain extra practice time on concepts that they learned in school. Parents like Julia, Angela, and Tanya, are explicitly informed that math can be integrated into the child's real-world at home through informal means, i.e., Teachable Moments. The parent is also given instructional and content support through Structured Activities, a clear indication that parents are invited to provide homework help.

Teachers teach as they normally do and insert BAIP teacher resources where it fits in IEPs and then share the accompanying parent activity with families. Parents can then engage in Teachable Moments and/or Structured Activities with their children. Parents who need a refresher on certain math concepts may look to the Structured Activities for guidance on what the concept entails, key math terms used, and activities to practice the concept. Parents who would think that short and quick activities in the real-world will give them more bang for their buck can incorporate Teachable Moments only or on top of Structured Activities. Parent provide feedback to teachers on what works and what doesn't and teachers can make the necessary adjustments or recommendations for students.

Facilitates More Than 2-Way Communication

Using BAIP improves communication, creating two-way and three-way dialogs. Two-way communication is facilitated through the parent resource website, parent activities, feedback channel, and common understanding of math in an aligned program. Through the sharing of parent activities, teachers share students' learning progress with parents and allow parents to see first-hand, how well their children fare. Parents engage students in informal (Teachable Moments) and formal (Structured Activities) activities that promote bonding and learning at home. For instance, Angela felt really proud when Amber demonstrated her understanding of math, "that she's learned it, and learned it so well that she can even teach her mommy."

Teachers and parents at the private school have traditionally communicated via phone or email. BAIP provides another channel for communication via the main parent resource site as well as after parent activities, with a focus on learning at home, and on specific math concepts that are being practiced. Parents can mark activities as complete or incomplete and this indicates to teachers as to which parent decided to engage in an activity with his/her child. The BAIP feedback option appears at the end of every parent activity and encourages parents to provide constructive feedback to teachers. Mrs. Joyce and Colin had an arrangement where they partner to provide Craig with additional instructional help. The arrangement can be improved with more transparency in what goes on at home and in school so Mrs. Joyce won't be surprised by Craig bringing completed homework that is done too well. This contributes to enhanced learning at home when teachers can provide further support and encourage parents to make joint decisions in the student's practice and pace of learning. Once feedback parameters are set up between teachers and parents, this could be an invaluable resource for teachers to understand how much practice students are getting at home, the type of help that parents are providing, and areas of

concern that members of the triad can work on to improve the partnership. Parents like Marissa and Colin could tell teachers that Miles and Craig prefer working on Teachable Moments as it was situated in the real-world and better fit their children's learning preferences.

Three-way-communication is supported when parents and teachers interact with students using the same math language. Parents have access to math terms and strategies that teachers use and are able to interact with teachers and students with increased confidence. Students do not get frustrated when their parents provide instructional assistance and make comments similar to Gordon's son, "No dad, that's not how we do it."

Parents feel that they have been invited to participate when 2-way communication is encouraged at school, teacher, and child level. This increases the likelihood that parents get involved. This leads to greater support for students and therefore enhanced learning.

Enhanced Learning at School and Especially at Home

What gives BAIP even more value as a functional model of parent engagement is the extended definition of learning at home, consistency of school and home instructional resources, and clarity of roles in the BAIP process. Parents better understand how their children learn math and can provide targeted and timely help, so students get more support from both the home and school. This enhances the school environment and perception of learning at home to foster positive home learning environments that are "coordinated with classroom work" (Mavrotheris & Meletiou-Mavrotheris, 2008, p. 350).

Summary

To bridge theory and application in support of a long term and comprehensive PI program, parents and teachers who are directly associated with a student need to talk about synchronizing perceptions of PI. If parents were involved at the decision making level on a PI

program, it could facilitate discussion on roles and expectations. Discussions could discuss options for differentiated levels of involvement for parents and teachers. This is a first step towards a successful, long-term, comprehensive PI program that begins by synchronizing perceptions of PI. These findings contribute to the literature of PI in learning at home, engaging parents in PI, and development and maintenance of PI programs within a model of parent engagement.

Future Research

These are some ideas for future research that would provide further insight into home-school partnerships, parent engagement for learning at home, and development of PI resources.

Observation #1: Effectiveness and Maintenance of PI Programs

This study raised an issue that is not new to PI. Why is it that even though teachers and parents invest a lot of effort in home support, PI programs tend not to produce long lasting results and the programs are difficult to maintain? I posit that the decision makers who implement PI programs approach the problem from different perspectives. They did not realize that they were not talking about the same issue in the same way. It is imperative that school representatives have open conversations with stakeholders about the roles they each play, how they fulfill those roles, and the resources they need to reach the common goal of enhancing the performance of students.

Recommended research #1

Future research could replicate the study but expand the sample to include parents who are less involved than parents in this study. Other parents might be more representative of parents in general and/or parents of students from different cultures. Would these comparisons

reveal the same disparity in perception of PI and affect the choice of partnership model as found in this study? Would new or less experienced teachers perceive PI differently? Further research could also look at schools with successful, struggling, or failing PI programs to see how perceptions of PI, roles, and expectations differ across programs.

Observation #2: Other Explanations for Gender Difference in PI

The literature suggests that mothers were generally more involved in providing academic support than fathers (Civil & Bernier, 2006; Epstein, 1995). The data from this study suggests that gender alone doesn't play the main role. It is content knowledge, availability, and connection with one's child that decides which parent is more involved. Though the parents who participated in the study were four mothers and two fathers, in actual fact, the mothers who were involved in learning at home were three, i.e., Tanya, Marissa, and Colin's wife. Fathers who were involved were Colin, and Angela's husband. Further research could explore these alternative variable to explain gender differences in PI. In addition, the parent-child connection could be explored to further understand why one parent is more involved than the other.

Recommended research #2

Future research could be conducted with a large sample size to focus on the gender difference in terms of which parent is most involved in, and the level and nature of involvement through participation in providing academic support for their child.

Observation #3: Bonding Over Parent Activities and Its Effects

I found it interesting that humor and banter played a large part in parent-child interactions. This was not explored in detail through this study but could be a key design element in future

parent resources. Students catching errors or tricking parents could be seen as a distracter from the task but could also be a way to increase complexity and engagement in learning activities. Activities should be both entertaining as well as educational for parents and students interacting during academic support sessions. This might result in increased bonding between parent and students that facilitates learning.

Recommended research #3

Future research could be conducted involving an intervention that integrates humor, opportunities for the child and/or parent to be creative in demonstrating different solutions on selected tasks to the other, and the inclusion of activities intended to engage the parent and student in casual debates. Findings could expand the understanding of parent-children experience of working together on educational activities and lead to an improvement in parent activity and resource that account for family culture, values, and interaction styles.

Observation #4: Alignment of Teacher and Parent resource With Content Standards

Teachers, parents, and students indicated that the consistent relationship of BAIP parent activities to classroom activities was a strength of the parent resource. This alignment appears to have given triad members confidence in the mathematics content covered in the parent resources.

Recommended research #4

Future research could be conducted covering a larger selection of lessons over content specific to teaching a series of related skills and concepts. The research design could remain the same as employed in this study. Confirmation of this observation could have an impact on the future design of parent resource in other subject matter content.

Observation #5: PI and Learning Retention

Minimal feedback was reported by teachers and parents on what students learned or did not learn. However, the focus of this study was on understanding roles and not on measuring student outcomes in the context of academic performance. Ultimately, the effectiveness of PI in academic support of their children is likely to be determined by the impact PI has on academic performance.

Recommended research #5

Future research could be conducted on the impact of PI on the academic performance of students as a consequence of PI. Such a study could be integrated into research in response to Observation #4. The BAIP is available for such research.

Observation #6: Synchronizing Perceptions of PI to Extend Partnership Model

There appears to be a gap in perception of PI between teachers and parents. This may result in collaborations being fraught by misperceptions on either side, which puts strain on PI programs. Teachers and parents could feel they were working towards different goals which would then hamper the success of home-school partnerships.

Recommended research #6

Future research could be conducted to develop the home-school partnership model using the extended definition of learning at home to include instruction. The focus could be on the process of aligning teacher and parent perceptions of PI, and then documenting the most efficient methods for doing so for large groups. Identification of such information and processes could be used for decision making when selecting PI programs, training users, and maintaining PI.

Observation #7: Teachable Moments for Children Who Are Not SWD

Not all parents are able to be as involved as the six parents in this study and some parents whose children are not SWD may not need to be as involved. It seems that students who do not struggle as much with math required less parental structured instruction as seen with Marissa and Miles, and Tanya and Trent. Angela also said she would give her child access to the parent resource for independent practice. The BAIP parent activity may be perceived as being too much of a commitment for some parents. However, it is reasonable to assume that parents who have high aspirations of their already high-performing children would be interested in further enriching their learning at home. I posit that parents of children who are not SWD could still benefit from engaging in short, daily, Teachable Moments.

Recommended research #7

Future research could be conducted with children who are not SWD and parents or adults in their lives, e.g., grandparents, uncles and aunts, older siblings, to see how they respond to the BAIP Teachable Moments. The focus could be on documenting perspectives of how often and important it is to integrate real-world math into their daily lives, and then introduce the BAIP Teachable Moments.

If results are positive, perhaps additional research could expand teachable moments into a database of activities in categories that reflect real-world practices, shared with parents and/or students via a mobile application. Examples of categories would include running a business (lemonade stand), keeping track of finances, shopping, cooking, farming, gardening, crafting, driving, travel planning, and even pet care. The research could explore the frequency of use and student perception of math, performance, and bond with the participating adult. This database

could also support a learning community of parents who contribute ideas on real-world math uses.

Limitations

The context of this qualitative study necessitated an in-depth examination of how teachers, parents and students interact when engaged in the process of academic support provided by parents to their children with learning disabilities in non-school settings. The role I played was integral to the research environment and the process of data collection. My acceptance by the parents, students and teachers was central to the study. I was sensitive to the varied personalities, beliefs, and roles of the participants. It also influenced decisions on the parameters of the study. These decisions centered on the selection of the school and the number of participants. It is likely that a different researcher would have different experiences and findings.

It was important that no member of a triad had prior experience with the BAIP. Because BAIP had been tested and/or used in many public schools, meeting this condition was made possible by the recruitment of a private school serving students with learning disabilities. A study on participants with experience using BAIP may not provide the same responses.

The selected school was a small private school serving only students with learning disabilities. Because the enrollment did not exceed 70 students, the faculty and staff knew each student and parent. The specific demographics of this school allow generalization only to a specific population. The instructional focus was matching instruction to the assessed needs of each student. The parents had voluntarily selected the school after their children had experienced serious learning problems in the public schools. Consequently, the parents were willing to invest

time, resources and effort in supporting their children in facilitating their academic performance. Other schools may not have such a specific population of students nor have parents who would be similarly involved as the parents in this study.

Generalization of results from this study is limited as it involved a small number of participants, and focused on SWD and their parents. However, there are some inferences that can be considered. All of the students were of average intelligence or above and have had public school experience. Most experienced some degree of school failure in learning mathematics and were then transferred to the private school by their parents. Parents hoped that in smaller classes, their performance in math would improve. The parents in this study were concerned about their children's lack of progress in mathematics and tried a number of support strategies. Strategies included hiring tutors, conferring with teacher(s) in seeking guidance, and investing personal time in assisting with homework. Most of the parents indicated that assisting children in mathematics was a challenge because current methods differed from how they were taught math. Parents were not familiar with the current language of mathematics and they were not always informed of the ongoing instruction children received until he/she was already behind other students. The students, themselves, were aware of their poor performance in math which often translated into social and behavioral concerns.

While these students have been identified with learning disabilities, there are students without learning disabilities who also struggle in learning mathematics. Concerned parents of these struggling learners pursue strategies similar to what the parent participants in this study did. These parents may not, as a group, possess the same level of intensity in their concerns as parents of a student with a diagnosed learning disability, but they too want their child to be

successful. Parents of students who struggle in learning mathematics, but who have not been diagnosed with a learning disability may value these features of the BAIP parent resource:

- Sharing skills and concepts that the child needs to learn that are currently being taught in class.
- Provide assistance to the parent in learning the current language of math along with the student.
- Sharing practical examples of activities that the parent can engage the child in.
- Increase communication between parent and the teachers to enhance the helpfulness of the parent in supporting the student and the teacher.

The intervention involved three teachers serving as participants in providing instruction in their classrooms on prescribed skills and concepts in mathematics. Two students were selected from each class along with one of their parents to become members of a triad. Six triads comprised the research participants. This made it feasible for the researcher to complete the observations and intense interviews within a span of time that was not intrusive on the school, the child's instruction or the parent's time. Although I inquired about how teachers taught with the BAIP lessons, this study did not include observations of teachers teaching the lessons or students taking the tutorials. In addition, a different set of teachers with unique characteristics may change the results of the study.

Parents and students were observed engaging in BAIP Structured Activities in a setting that was natural to students but not as familiar to parents. Students receive instruction in school and were therefore comfortable with the setting. However, students may not have been as familiar with receiving instruction from their parents in school instead of at home. Parents usually provide support at home and it was not as natural to teach their children mathematics in

the school. However, parents visited the school often for school-related events and are familiar, and therefore comfortable with the place. Each parent-child pair were also asked to engage in a fun activity to familiarize them with thinking aloud and working together in that environment.

Several fidelity issues were observed in the execution of the BAIP research model. One teacher did not assign tutorials to students and the wrong parent activity was assigned to a parent. This meant that the student did not have as much practice on the concepts as expected by the time of the parent-child observation. The wrong parent activity covered a concept that was too simple for the student which may have led to distraction and/or boredom during the parent-child school session. However, the focus was on the experience and not the comprehension of content. It is possible that some lessons will be too simple for students so a scenario like this is likely to also occur in reality.

Two frameworks were adopted to guide the research. They included Epstein's six types of PI (1998) and Hoover-Dempsey and Sandler's Motivations for Parent Involvement (2005) s. As the study progressed, it became apparent that PI at the private school could benefit from more structure. Thus, Swap's theory of home-school partnership, was examined to help establish a broader model of parent engagement. The models were judged to best fit the purposed of the research study. Different approaches to analyzing the data would probably require different frameworks.

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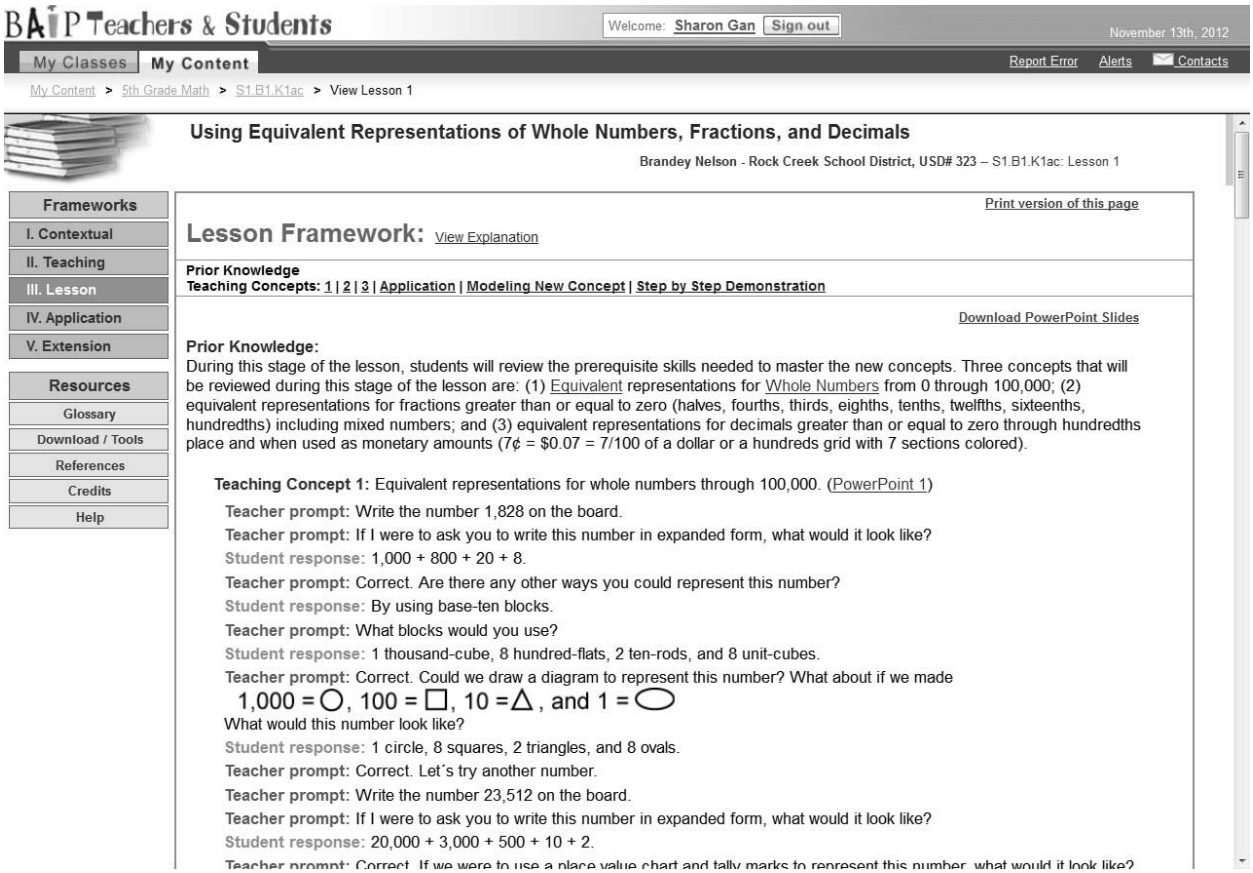
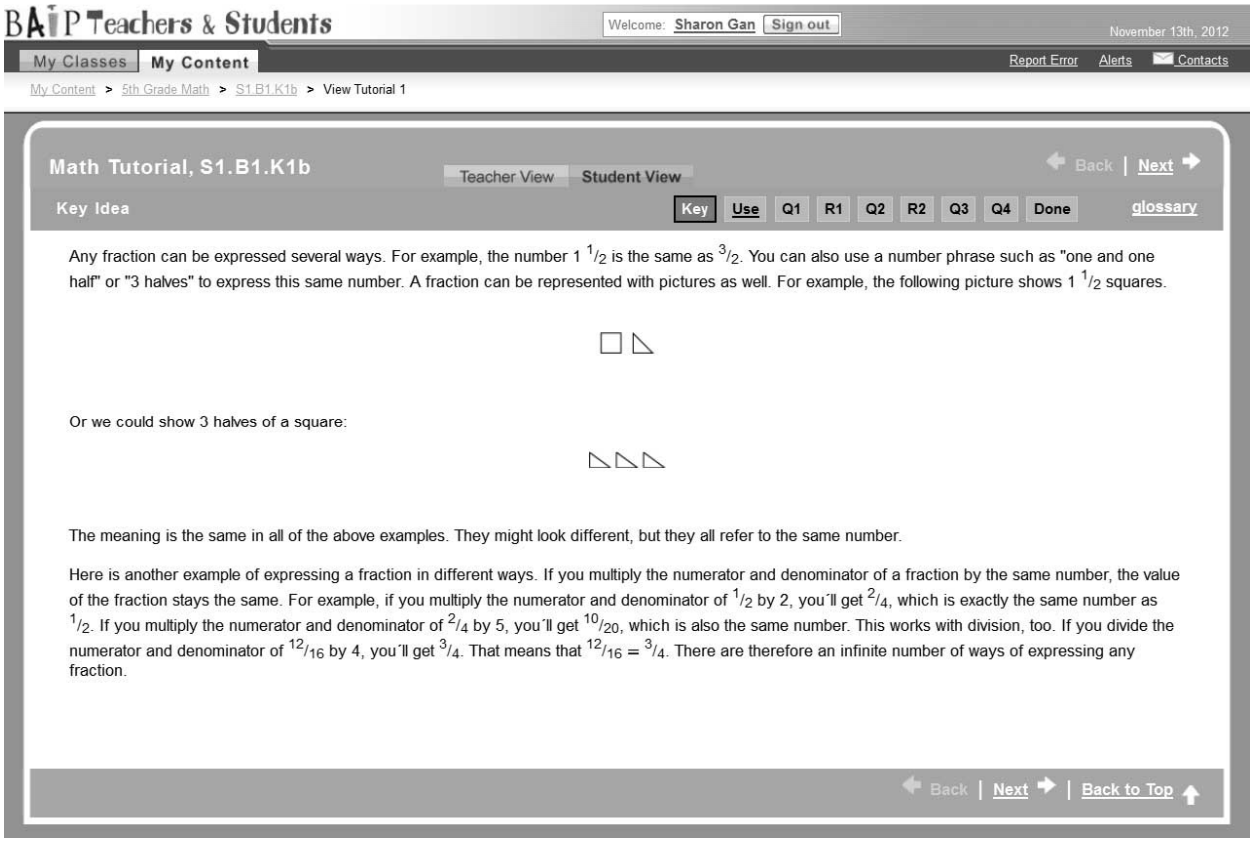
Appendices

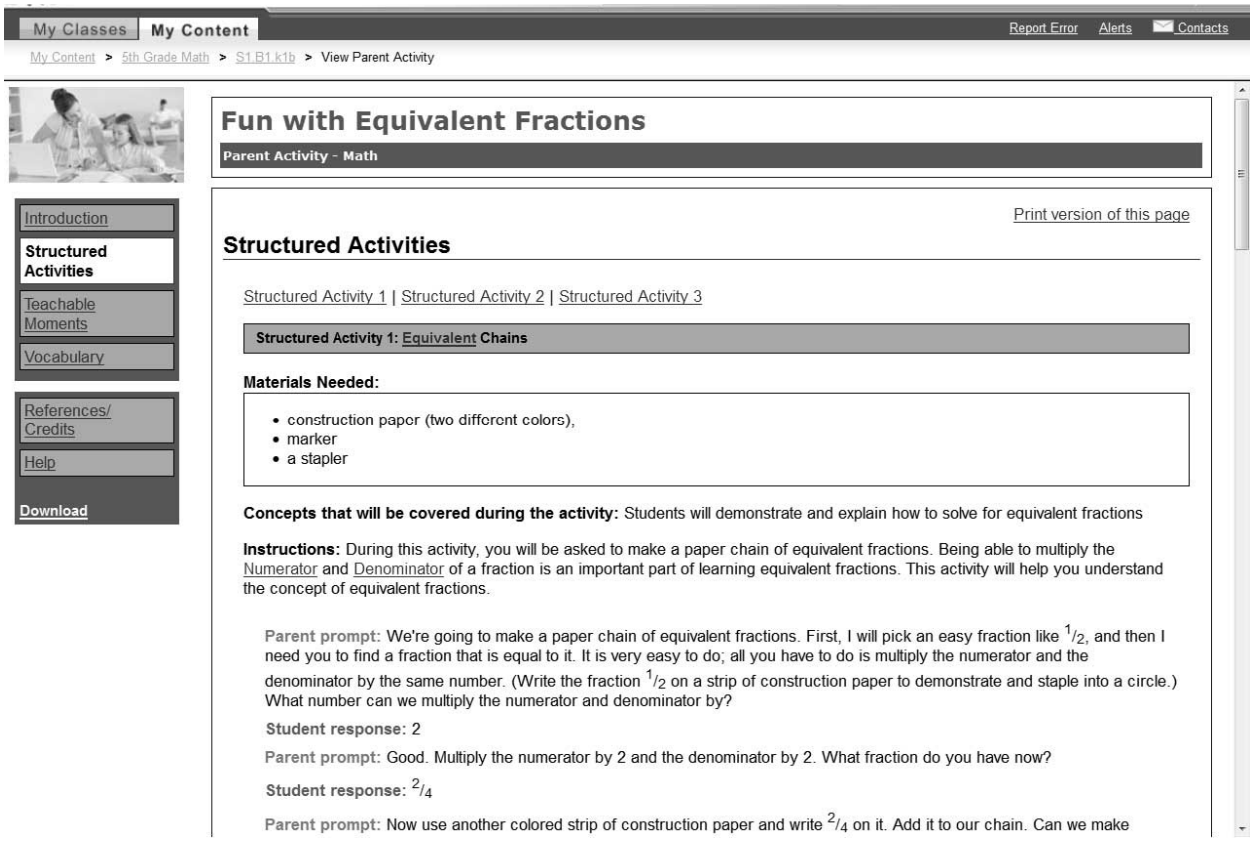
Appendix I: BAIP Teacher Lesson



Appendix II: BAIP Student Tutorial



Appendix III: BAIP Parent Activity



Appendix IV: Letter to Parents

Dear **Parent**,

[School's name] has been provided with an opportunity to access a state-of-the-art supplemental program designed to teach critical math skills to students who struggle in learning. This program, *Blended Assessment with Instruction Program (BAIP),* has undergone extensive testing during the past eight years by researchers at the University of Kansas Center for Research on Learning (KUCRL). The gains that students have experienced have been very significant.

KUCRL researchers have asked if *[School's name]* would be willing to test a few elements of this curriculum with some of the students who attend *[School's name]*. They want to make certain that *BAIP* is optimally effective with the kinds of students who attend schools like *[School's name]*. The attached page provides all of details regarding this study. However, in a nutshell this is what will be involved.

[Student's name]'s teacher, *[Teacher's name],* will teach one of the lessons from BAIP that is tailored to meet *[Student's name]'s* needs. Upon completing the lesson, a researcher will conduct a short interview with *[Student's name]* to determine how he felt about the lesson (e.g., how helpful it was to him, how confident he now is about the material that he was taught, etc.).

At *[School's name]*, you and *[Student's name]* will sit together and work through a BAIP lesson. A researcher will be present, and you will be recorded during this time.

Accompanying each BAIP lesson is a set of activities designed specifically for parents to use to support their child in learning the material in the lesson. You will be interviewed before teaching this lesson.

Upon completion of teaching the lesson, a researcher will interview you as well to determine how helpful the parent materials were. You will be compensated $250 for your time and participation.

[School's name] is strongly supportive of this study for two reasons: (1) we have carefully reviewed the BAIP materials and are most impressed with their design – they are based on the most current research regarding learning and instruction; and (2) *[School's name]* will be granted full access to all of the BAIP modules and support materials at *no cost* for the entire 2013-14 academic year for participating in this study.

Your participation is completely voluntary. We are eager to answer any questions that you might have. Please carefully read the enclosed description of the study and email the contact person (*email address removed*) by *[date]* indicating if you'd like to participate or not.

WHO IS INVOLVED?

1. The University of Kansas Center for Research on Learning (KUCRL). The KUCRL has worked with very closely with *[School's name]* since its inception. Many of the instructional materials we currently use at *[School's name]* were designed and validated by the KUCRL.
2. [School's name]
3. You and your child
4. [TEACHER]

WHAT IS THE BLENDED ASSESSMENT AND INSTRUCTION PROGRAM (BAIP)?

- Research-based lessons for teachers
- Online interactive tutorials for students

- Extensive support activities and resources for parents to help mesh classroom and home learning experiences
- All BAIP lessons are closely aligned with state and national math standards
- Developed by KUCRL researchers and master teachers, field tested in 200+ school districts

For additional information see: http://www.elearndesign.org/baip_demo

WHAT AM I BEING ASKED TO DO?

- You will be asked to work with *[student's name]* to complete *BAIP* activities.
- You will be interviewed before and upon completion of the activities.
- *[student's name]* will be interviewed following the lesson.
- The interviews will be audio and video recorded (for research purposes only – only the researchers working on this study will hear/see these recordings).
- In total, we ask that you arrive at *[school's name]* at 1 pm for your interview, interaction with *[student's name]*, and post-activity interview. Your afternoon will not exceed the 1-430 pm time frame.

NOTE: The focus of this study is on how the *BAIP* resources are used by students and parents, what works well, and how to improve these resources. *[student's name]'s* grades will not be affected by his performance on this lesson.

CONFIDENTIALITY

Student, parent and teacher identities will be kept strictly confidential in the research report and only the researchers involved will have access to the information. You will be asked to sign a consent form, and will be recorded while working with *[student's name]* at *[school's name]*. You may withdraw from the study at any time.

Appendix V: Next Steps for Teachers

Dear Teachers,

Thank you for consenting to participate in the study. Here are some steps to help us move forward with the study prior to the interview. References are made to the BAIP Management system manual to provide further information as well as guided instructions on how to navigate the system. Log in information may be found in *BAIP Management System Manual pages 2 – 3.*

Step 1. Set up BAIP class structure.

1. Create a class (each class may be a small group of students or an individual) in BAIP for your students. *Refer to BAIP Management System Manual pages 6 – 9.*
2. Each participating teacher will have 2 participating students.
3. Once I have the names of each student for each teacher, I will be able to assign ID numbers to each student.
4. Add students (with student ID provided by the eDL) to the BAIP class you just created. I will send you the student IDs for each student.
5. Send students their BAIP IDs and passwords. *Refer to BAIP Management System Manual pages 13 – 15.*
6. Assist students with logging in and accessing tutorials.

Step 2. Identify the BAIP lesson you wish to teach as part of the study.

1. Review your instructional plans for the week when we will be collecting data
2. Review the BAIP catalog for lessons that you feel will be most appropriate given your instructional plans that week. *Refer to BAIP Management System Manual pages 16 – 21.*
3. Select a lesson that you feel would be appropriate for the students you have selected for the study.
4. Review the lesson you will be teaching carefully. Feel free to make modifications as needed to individualize the lessons.
5. Teach the selected lesson using the amount of time you deem necessary to cover the content on the lesson. Please e-mail me the lesson indicator (grade-standard-benchmark-indicator) that you decide to teach.

Step 3. Assign student tutorial(s). The tutorial(s) can be assigned any time after you begin the lesson.

1. There are at least two tutorials provided per lesson. At least one needs to be completed. However, feel free to assign more than one tutorial since they will not be familiar with the tutorial. Tutorials are assigned by classes, not to individual students, unless that student is the class. *Refer to BAIP Management System Manual pages 22 – 28.*
2. Select at least one accompanying tutorial that you feel is most appropriate for each student. They need not be the same for each student.
6. Have a place set up for the student to access the tutorial(s) on a computer. Help the student get started. *Refer to BAIP Tutorial Manual pages 3 – 5.*
3. Data will be reported on the progress automatically to you on the progress of the of each student

Step 4. Assign parent activity. The parent activity can be assigned any time after you begin the lesson.

1. There is one parent resource for each lesson indicator. At least one needs to be completed. *Refer to BAIP Management System Manual pages 22 – 23.*
2. Select the accompanying activity that you feel is most appropriate for each student and his/her parent before assigning it to students. They need not be the same for each family.
7. Parents will need their child's BAIP ID to create a linked parent account to access the activity and other parent resources. *Refer to BAIP parent resource Manual pages 3 - 8.*
3. Have parents review the lesson prior to engaging in activity. *Refer to BAIP parent resource Manual pages 3 -13.*
4. Have a place (testing center at HA) set up for student and parent to engage in the activity.
5. The Teachable Moments (real-world examples) section should be engaged in prior to the observed activity as they are not structured activities. I will be present to audio and video record the session as well as conduct pre- and post-activity interviews with both parent and student.
6. Check if parents have completed the activity with their child and how they rated the activity.

Step 5. Teacher interview

To view the manuals online, please log in to BAIP and go to http://baip.elearndesign.org/gettingstarted/. Please let me know if you have questions. I am available via e-mail at [email address removed] or on my cell at [number removed].

Thank you,
Sharon Gan
Graduate Research Assistant
e-Learning Design Lab

Appendix VI: Next Steps for Parents

Dear (parent's name),

Thank you for consenting for you and your child to participate in the study. Here are the steps we will follow in moving forward. References will be made to the BAIP parent resource Manual to provide additional information on components as well as detailed instructions on how to navigate and use the system.

Step 1. Access BAIP Parent Resources

Your child has been given a student ID to access BAIP student tutorials. Use your child's student ID to create a linked parent account on BAIP.elearndesign.org to access parent resources. *Refer to BAIP parent resource Manual pages 3 – 8.*

The resource includes an animated dictionary, tip sheets and activities that are aligned with classroom instruction and student tutorials. The animated dictionary and tip sheets are optional resources that you may find to be of interest.

Review the parent activity that (teacher's name) has shared with you. Each activity has three components, structured activities, teachable moments, and vocabulary. *Refer to BAIP parent resource Manual pages 9 –12 for more information about each component.*

Step 2. Engage in Parent Activity

1. Review the activity online or print it out. *Refer to BAIP parent resource Manual page 13 on how to print.*
2. Select a day to engage in the study at school from 1pm – 4.30pm. Use Teachable Moments component on an occasion prior to the selected date of the interview. They should be used in a casual and informal manner.
3. Engage in the structured activity on the selected date.

Step 3. Interview

- Meet me (Sharon Gan) on the selected day at 1pm for the pre-interview.
- Engage in parent activity with (student's name) at 2.20pm in the testing center at school. The session will be audio and video recorded and I will be present as an observer.

- After completing the parent activity, complete the BAIP parent activity feedback online and mark it as completed.
- Take a short break while I interview (student's name).
- Engage in an interview with me after the interview with (student's name) has been completed. The session will end by 4.30pm

Thank you. Please let me know if you have questions. I am available via e-mail at [email removed] or on my cell at [number removed].

Thank you,
Sharon Gan
Graduate Research Assistant
e-Learning Design Lab

Appendix VII: Lessons Selected for Study

Grade	Standard	Benchmark	Indicator	Lesson Title	Parent Activity Title
3rd	**Standard 1** requires the student to know how to apply numerical and computational concepts and procedures in a variety of situations	**Benchmark 4** requires the student to model, perform, and explain computation with positive rational numbers and integers in a variety of situations.	**Indicator K7** requires the student to identify multiplication and division fact families through the 5s and 10s.	Lesson 1. Multiplication and Division Facts Through the 5s and the 10s	Multiplication and Division Fact Families 0-5 and 10
5th			**Indicator K4** requires the student to know and explain numerical relationships between percents, decimals, and fractions between 0 and 1.	Lesson 1. Greatest Common Factor and Least Common Factor of Multiples of Two	Greatest Common Factor and Least Common Multiple
6th			**Indicator K2f** requires students to perform and explain computational procedures for addition, subtraction, and multiplication of fractions, including mixed numbers, and then expressing answers in simplest form.	Lesson 1. Adding, Subtracting, and Multiplying Mixed Fractions	Adding, Subtracting, and Multiplying Fractions
6th		**Benchmark 1** requires the student to demonstrate number sense for rational numbers and simple algebraic expressions in one variable in multiple situations	**Indicator K4** requires the student to know and explain numerical relationships between percents, decimals, and fractions between 0 and 1.	Lesson 1. Knowing and Explaining Numerical Relationships	Numerical Relationships Between Percents, Decimals, and Fractions
fifth *			**Indicator K2a** requires the student to compare and order integers	Lesson 1. Comparing and Ordering Integers	Comparing and Ordering Integers Around the House and in the News

* The wrong parent activity was assigned even though the correct lesson (mat_6_1_1_K4_1) was taught.

Appendix VIII: Parent Workshop Presentation

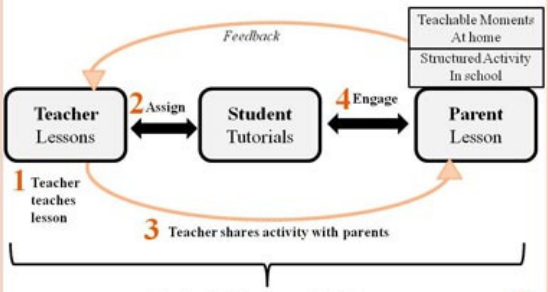
Study of Lived Experiences: Blending Assessment with Instruction Program

Parent Orientation

Sharon Gan-Yang
Graduate Research Assistant / PhD Candidate
e-Learning Design Lab
The University of Kansas
shargan@ku.edu

1

Overview : The Study



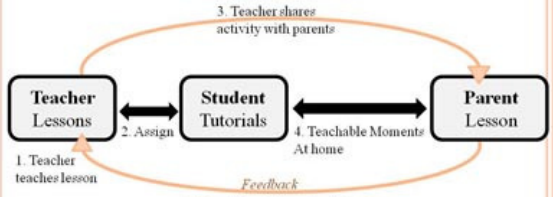
- Teacher, student and parent interviews
- Parent-student observation

4

Today's Agenda

- Overview of the study – *What is this about?*
- Parents – *What do I do next?*
- Observation/Interview Schedule – *What to expect?*
- Creating a parent account – *How do I access it?*

2



5. Parent Pre-Observation Interview
6. Parent-Child Session
   Observation of Structured Activities
7. Student Post-Observation Interview
8. Parent Post-Observation Interview
9. Teacher Interview

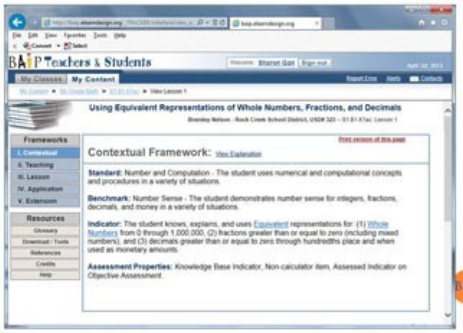
5

Overview : About BAIP

- Developed by the eLearning Design Lab (eDL) at the University of Kansas (Meyen, Greer & Poggio, 2009)
- Program to align classroom instruction with curriculum and state assessment standards
  - 350 Teacher Lessons
  - 405 Student online tutorials
  - 136 Parent activities
- Teachers reported the need for parent resources to enhance instructional support at home that is also aligned with the instruction occurring in the classroom.

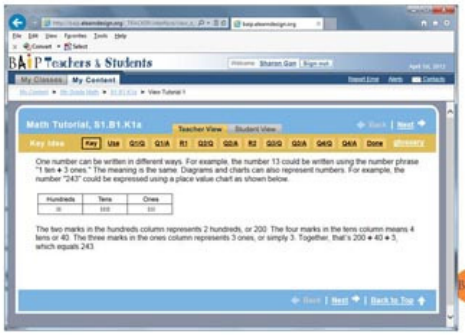
3

Teacher Lesson



6

Student Tutorial



7

Step 1: Creating a Parent Account

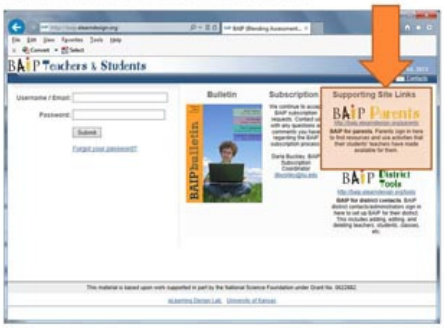
- Got to http://baip.elearndesign.org/parents
- Create New account
  - Your e-mail address
  - Choose a password that you'll remember
- Add your child
  - Need child's BAIP ID and Password

10

Parent Activity

8

http://BAIP.elearndesign.org



11

Steps for Parent Involvement

Step 1. Access BAIP Parent Resource
- http://baip.elearndesign.org/_PARENTS

Step 2. Engage in Parent Activity
- Teachable moments to be completed prior to observation/interview
- Structured activities to be completed during observation

Step 3. Set up observation & interview date (1 – 430pm)
- Mondays – 8th, 15th, 22nd April
- Thursdays – 11th, 18th , 25th April

Step 4. Participate in observation and interview

9

BAIP Log-in Screen for Parents

12

STEP 3: OBSERVATION/INTERVIEW SCHEDULE

Estimated Time	Event
1:40 – 2:20pm	Parent pre-observation interview (*audio recorded*)
2:20 - 3pm	Parent and student engage in structured activities with think-aloud method (*Audio and video recorded*)
3 – 3:30pm	Student post-observation interview (*audio recorded*)
3:30 - 4:30pm	Parent post-observation interview (*audio recorded*)

- Mondays – 8th, 15th, 22nd April
- Thursdays – 11th, 18th , 25th April

13

THINKING ALOUD

- Verbalize inner thoughts
- Respond to questions posed by other person
- Observer only interjects with "please keep talking"
- You can interact with the activity by
  - Wondering
  - Making observations
  - Arguing
  - Estimating
  - Hypothesizing
  - Speculating
  - Guessing

14

QUESTIONS?

15

Appendix IX: Parent and Student Interview Protocol

BAIP Parent Involvement Process Study
Pre-Interview Protocol for Parent
University of Kansas

INSTRUCTIONS

Good afternoon. My name is Sharon. Thank you for participating in my study. I am pleased that you are willing to share your experience in working with [student's name] on the math activities. The activities are part of the Blending Assessment with Instruction Program (BAIP) that I have been working on with a large number of teachers and colleagues at the University of Kansas. That program is comprised of lessons for teachers to use, online tutorials for students and resources for parents. All of the resources are aligned with standards in mathematics. Our goal is to help students, especially those who may experience difficulty in math to improve their knowledge and skills.

The first part of today's session involves a pre- interview in which I will ask you about the experiences of [student's name] in her instruction in mathematics, and your involvement with [student's name] in helping her improve her skills in math. You know your child well and have followed [student's name]'s progress. I am not asking you to evaluate her achievement or the teaching she has received. I just want to gain an understanding of the experiences [student's name] has had in math. Children vary greatly in how they learn math skills. I certainly did as a child.

THINK ALOUD

To help me understand your thought process as you use the BAIP resource, I would like you to think aloud, which means saying in detail whatever you are looking at, thinking, doing, and feeling at each moment. I am testing the process of the system, not you as the user, and that any difficulties are the system's, not yours.

Let's practice thinking aloud. Could you try to recall what your home looks like on the inside and then count the number of windows that are in your living room?

Thank you. That was good thinking aloud. Let's keep using think aloud as you engage in the activity with your child.

MEDIA RECORDING INSTRUCTIONS

If it is okay with you, I would like to audio record our conversation. This will help me remember our conversation.

PART I – Pre-Activity Parent Interview

1. Please take as much time as you need to recall your child's education in the past school year, with particular emphasis on mathematics. As you think about **[student's name]'s** experiences in school last year, what comes to your mind?
   - It could be a specific homework assignment or a partial memory of some work that **[student's name]** shared with you, or something you think isn't important.

- Please describe positive or fun experiences that **[student's name]** has had with mathematics?
- Please describe experiences that **[student's name]** has had with mathematics that may have been challenging.
- What do you feel **[student's name]** thinks of mathematics as something to be learned?

2. Please share your views on the school's responsibility with regards to teaching mathematics?
   - Who is most responsible for **[student's name]**'s mathematics education?
   - Do you recall school invitations to get involved in **[student's name]** mathematics education?

3. Describe in detail, the role you play in **[student's name]**'s mathematics education. Please share with me everything you can, even the things you think are not important, and even if you can only remember something partially. Prompts:
   - Please describe your mathematics involvement in **[student's name]**'s school?
   - Please describe your policies on mathematics homework, if any?
   - When was the last time **[student's name]** asked you for help with his/her mathematics homework?
   - Think of the last time you helped your child with understanding a math concept. How did you go about doing it?
   - Please describe your involvement at home with **[student's name]** asking about or illustrating practical applications of math?
   - Please describe the process of finding resources to help **[student's name]** in math?

4. Reflect on your own experience in learning mathematics. Can you tell me what it was like for you? Please share everything you can, even the things you think are not important.
   - How have you used mathematics in your life as an adult?
   - How comfortable are you with teaching someone else mathematics?

5. How comfortable do you feel in helping [student's name] understand their instruction in mathematics?

   Prompt:

Not comfortable		Somewhat comfortable		Very comfortable
1	2	3	4	5

Thank you very much for permitting this interview. I don't have any more questions for you until after the observation. Could you take a few minutes to read this preamble and sign this consent form to give me permission to use information you have shared in my study please?

(Hand form over)

*This second preamble (assent form) is for **[student's name]**. Would you please look it over (Read out preamble) (Hand over consent form and parent-guardian assent form to parent.) and give me permission to interview [student's name]? Thank you.*

PART II – Activity

*The next part is a short activity for you and **[student's name]**. **[student's name]**'s teacher has taught a BAIP lesson and **[student's name]** has worked on the accompanying student tutorial. **[student's name]**'s teacher has also shared the parent resource with you. Could you engage **[student's name]** in the structured activities in the parent resource and then meet with me for a post-interview please? The purpose is for me to learn how the resource is engaged. You need not go through the activity in sequence. There is no right or wrong way of using the resource so please feel free to use it in the way that best suits you.*

BAIP Parent Involvement Process Study
Interview Protocol for Students
University of Kansas

ASSENT FORM BEFORE ACTIVITY

My name is Sharon and you must be **[student's name]**. I am pleased to meet you. Your Parent and I have been visiting about my interest in helping students learn math. My main interest is in learning about how parents can help their children learn math skills. I would like to show you an example of an activity that some students enjoy doing with their parents.

SHOW AN ACTIVITY AND GO THROUGH IT WITH THE STUDENT. Select a fun one☺

I work with teachers to develop math activities for parents to share with their students. I want to make them better and have asked your Parent if she will share some math activities with you. I would like for you to work on some activities with your Parent. The activities are like a practice session where you have fun and learn. The activities that you do with your Parent are also like activities that your teacher, **[teacher's name]**, has taught in your class. After completing the activities, I would like you to describe your experiences and feelings about the activity. I may have some questions to help me understand your experience better. I am interested in your ideas and how you like the activities. That will help me develop better activities for other students.

THINK ALOUD

To help me understand your thought process as you use the BAIP resource, I would like you to think aloud, which means saying in detail whatever you are looking at, thinking, doing, and feeling at each moment. I am testing the process of the system, not you as the user, and that any problems faced are the system's, not yours.

Let's practice thinking aloud. Could you try to recall what your home room looks like on the inside and then count the number of windows that are there?

Thank you. That was good thinking aloud. I can imagine the windows in your home room now. Let's keep using think aloud as you work on the activity with your mom.

I will be happy to answer any questions you may have now or when we are talking together later.

PART III – Parent-Child activity

PART IV – Post Activity Student Interview

Hi **[student's name]**, you just completed an activity with your mom and I am interested in your ideas and how you feel about the activities. I have some questions for you to help me understand your experience better. Whatever you share will help me develop better activities for other students.

(Parent-student activity review)

1. Think about the activity that you just completed with your Parent. Have you worked on school activities with your Parent before?
    - Yes – Can you describe the last time you did an activity like this with your Parent? Take as much time as you need to think about the activity. Even if you do not think it is important, I am interested in what you think.

2. Think of the last time you were working on a math activity in class. Was that activity like the one with your Parent?

    Prompts:
    - How was the class activity different from the one your Parent shared?
    - Please describe what you were learning during the activity with your Parent?
    - Please list the mathematics words that your Parent used.

3. Please describe how you felt during the activity that you just completed. I am interested in any thoughts that you have.

4. Think about the activity you completed with your parent. Would you like to do more of these activities? Would you like to do them with your Parent more often?

(Parent resource)

5. Please tell me which part of the activity you liked the most and why. Tell me anything you like.

6. Please tell me which part of the activity you liked the least and why. Tell me anything you did not like.

7. Please describe what would make the activity more interesting for you.
    - How are the activities similar to the ones you learn in school?

8. Is there anything else you would like to tell me? I am interested in your ideas and feelings about the activities and working with your Parent.

CLOSING

Thank you very much for chatting with me. You did a wonderful job of sharing your thoughts. I don't have any more questions for you today. I will be going over the information you have shared with me and may have further questions. Would it be okay for me to contact your mom with those questions? Thank you.

PART V – Post Activity Parent Interview

*The third and last portion of this study is the post-interview in which I will ask you about the parent activity that you did with **[student's name]**. I am not asking you to evaluate her achievement or the teaching she has received. I just want to gain an understanding of the experience you and **[student's name]** had in using the resource. Families vary greatly in how they utilize parent resources.*

(Parent-child activity)

1. Think of the BAIP parent activity you engaged in with **[student's name]**. How does that experience vary from previous mathematics learning experiences with **her**?

Prompts:

- Please describe how the experiences are different.
- Please describe how the experiences are similar.
- Please describe how a parent-child session is initiated. E.g. Who brings up the activity first? You or your child?
- Please describe how the activity ended.

2. Recall in detail the activity that you just completed with **[student's name]**. Please describe in detail the emotions you experienced throughout the session. Take your time to recall the event and begin from the start of the activity. Please tell me everything which comes to mind in your own time and pace.

3. Please describe in detail your thought processes as you were working on the section. Please tell me everything which comes to mind in your own time and pace.
   - Structured activities
   - Teachable moments
   - Vocabulary

4. Take some time to evaluate the session you had with **[student's name]** using the BAIP activity.

(Parent resource)

5. What were your expectations of the activity? Which were met/unmet? Please tell me in detail, even the bits that you don't remember entirely.

6. Do you see any value add in having the activity aligned with mathematics standards and what teachers teach in the classroom? Please tell me in detail, even the bits that you don't remember entirely.

7. Describe the part of the activity you liked the **most** and why. Please tell me in detail, even the bits that you don't remember entirely.

8. Describe the part of the activity you liked the **least** and why. Please tell me in detail, even the bits that you don't remember entirely.

9. In your own time and pace, please tell me what would make the activity more effective for you. Please report everything that comes to mind, even if it's only a partial memory, or something you think that isn't important.
   - How would you change the process of accessing the resources?
   - How would you change the language used in the activity?
   - How would you change the format to make it more user-friendly?
   - How would you change the dictionary to make it more useful?
   - Would you add other resources?

10. Please take some time to think about the parent resource and then tell me in detail what you think of the resources.
    - Parent-child activities
    - Tip sheets
    - Animated dictionary

(BAIP Process)

11. What do you think of this process - Your child's teacher teaches a concept and then shares an activity that covers the same concept with you, which you may then engage in with **[student's name]**.
    - How does providing feedback to the teacher through the site benefit you?
    - Please describe how a parent-child session is initiated. E.g. Who brings up the activity first? You or your child?
    - Please describe the level of confidence you have in the activity.

- How do you think such activities will affect **[student's name]**'s performance in mathematics?

12. Please reflect on the activity. Would you do more of such activities?

13. If you were to do more activities, would you do them in the same way or different? Please tell me in detail, even the bits that you don't remember entirely.

(Role construction)

14. After having completed the activity with your child, how do you think [student's name] perceives mathematics?

15. Earlier, you shared your views on the school's responsibility with regards to **[student's name]**'s mathematics education. *(remind parent of information from pre-interview)*. How has it changed after this activity?
    - Please list the parties whom you think are most responsible for [student's name] mathematics education.
    - Please describe invitations from [student's name]'s school to get involved in [student's name] mathematics education?

16. Earlier you described the role you play in **[student's name]**'s mathematics education as (repeat parent's description). Having experienced this activity, how would your response differ now?
    Prompts:
    - Please describe your mathematics involvement in **[student's name]**'s school.
    - Please describe your policies on mathematics homework, if any.
    - When was the last time **[student's name]** asked you for help with his/her mathematics homework?
    - Think of the last time you had to help your **[student's name]** with understanding a math concept. Please describe how you went about doing it.
    - Please describe your mathematics involvement at home.
    - Please describe the process of finding and using mathematics resources to help **[student's name]**.
    - How comfortable are you with mathematics?

17. How comfortable do you feel in helping **[student's name]** understand her instruction in mathematics?

Prompt:

Not comfortable		Somewhat comfortable		Very comfortable
1	2	3	4	5

- Please describe what you do to help your child succeed at mathematics?
- How do you think you did as a parent instructor, using the parent resource?

18. Do you have any other ideas you would like to share with me? Any other thoughts?

Family size (# of people in the family): mom ___ dad ____ siblings ____
Child's ranking: first child ____ 2nd child ____ 3rd child ____ 4th child ____ 5th child ____
Parents' highest education level: _____
Major: _____
Current job: _____
Age range: 0 – 25 | 26 – 35 | 36 – 45 | 46 – 55 | 56 – 65 | 66 – 75 | 76 – 85 | _____

Household income: _____

Appendix X: Teacher Interview Protocol

BAIP Parent Involvement Process Study
Interview Protocol for Teacher
University of Kansas

PART 1.

INSTRUCTIONS

Good afternoon (evening). My name is Sharon. Thank you for participating in my study regarding the Blended Assessment with Instruction Program (BAIP) process and parent resources. This session involves an interview in which I will ask you about your experiences using one of the BAIP lessons in your classroom, and your thoughts on the tutorial and parent resources. There is no right or wrong response or desirable or undesirable answer to my questions. I would like you to feel comfortable with saying what you think and feel.

This interview will be more of a conversation as I want to learn about your views on the helpfulness of the lesson as well as how it might be strengthened.

You are an experienced teacher and I would like for you to share your observations about the lesson, how useful the information was and anything that you remember from teaching the lesson including the reaction of your students to the lesson.

MEDIA RECORDING INSTRUCTIONS

If it is okay with you, I would like to audio record our conversation. This will help me get all the details and at the same time allow me to carry on an attentive conversation with you.

CONSENT FORM INSTRUCTIONS (If teacher did not sign at group meeting)

Before we get started, (teacher's name), I need you to take a few minutes to read this consent form agreeing to participate (read and sign consent form). (Hand over consent form to teacher.)

Teacher Interview
(Usage of BAIP)

1. Think back on your experience with the BAIP lesson. I am not trying to evaluate the lesson. I want to learn from you about your experience with the lesson. In your own time and pace, please reflect on your experience with the BAIP lesson and tell me everything which comes to mind, even if it's only a partial memory, or something you think isn't important.

2. Please describe your experience in planning and using the lesson.
   Prompts:
   - Please describe the amount of preparation you needed prior to using the lesson?

- Please describe the way you used the lesson and tutorials in class?
- How did you integrate the lesson into your teaching plan?
- How did you get students involved in the lesson?
- What were your thoughts about involving the parents in using the parent resources?

(Perceptions of effectiveness)

3. Based on your experience, please comment on the ease or difficulty in using the lesson.
4. Please tell me which part of the lesson you like the most and why? Please tell me in detail, even the bits that you don't remember entirely.
5. Please tell me which part of the lesson you like the least and why?
6. What would you change in the lesson or add to the lesson as a resource for teachers?

(Student reactions)

7. How did your students respond to the lesson?
8. What do you think would make BAIP type lessons more useful to you as a teacher?
9. What do you think will make BAIP type lessons more helpful for your students?

(Parent resource and reaction)

10. What are your thoughts on the concept of a parent resource?
11. What do you think will make the parent resource most helpful to parents in assisting their child?
12. Please take some time to think about the parent resource and then share with me in detail what you think of the idea of providing resources to parents that are aligned with lessons.
    Prompts: Parent-child activities, Tip sheets, Animated dictionary

(BAIP process)

13. What do you think of this process? You teach a concept and then share an activity that covers the same concept with your students' parents, which they may then engage in with their child.
    Prompts:
    - Does providing feedback to the parent through the site act as a resource?
    - Who brings up the activity first? You or your student?
    - Do you have confidence in the activity?
    - How do you think such activities helps (child's name) with succeeding at mathematics?
    - How do you think such activities affect parent involvement at home?

CLOSING

Thank you very much for permitting this interview. I don't have any more questions for you today. I will be reviewing the information you have shared with me and may have further questions. Would it be okay for me to contact you with those questions? I will also be creating a transcript of our conversation and emailing that to you to look over to be sure that I got the right information.

Appendix XI: Observation Checklist

Model for Researching Parent Engagement in Academic Support
Observation Checklist

Parent Name: _____ **Student Name:** _____

Activity indicator: G___ S ____ B ____ I _____ **Date:** _____ **Observer:** _____

Instructions to parents prior to observation

Please engage in a parent activity with your child that your child's teacher has shared with you via the BAIP site. While you do so, try to say everything that goes through your mind. That helps me understand how the parent activity is used. Note: If subject stops talking, interject with "Please keep on talking."

1. Parent administration of BAIP activity	**Observation**		**Comments**
a. Parent was able to easily access BAIP parent site on laptop	____ Yes	____ No	
b. Parent was able to easily create new account	____ Yes	____ No	
c. Parent was able to add student(s)	____ Yes	____ No	
d. Parent explored all three tabs (my student, completed activities, resources)	____ Yes	____ No	
e. Parent was able to find currently assigned activity	____ Yes	____ No	
f. Parent referred to activity off of his/her laptop / pc	____ Yes	____ No	
g. Parent printed hard copy of parent activity	____ Yes	____ No	
h. Parent read through activity before engaging student	____ Yes	____ No	
i. Parent read through the activity with student	____ Yes	____ No	
j. Parent provided student prompts when child did not know answers	____ Yes	____ No	
k. Parent is unfamiliar with the subject matter of the activity	____ Yes	____ No	
l. Parent appeared patient while engaged in the activity	____ Yes	____ No	
m. Parent was distracted during the activity.	____ Yes	____ No	
n. Parent used the components of the activity in this order:			
Introduction	#_____		
Structured Activities 1, 2, 3	#_____		
Teachable Moments	#_____		
Vocabulary	#_____		
Help	#_____		
(Animated) Dictionary	#_____		
Tip sheets	#_____		
o. Parent appeared to enjoy the activity.	____ Yes	____ No	
p. Parent asked student if the activity is helpful	____ Yes	____ No	
q. Parent provided his/her child with encouragement	____ Yes	____ No	
r. Parent said negative things about math. If yes, how many times?	____ Yes	____ No	
s. Parent rated the activity after completion	____ Yes	____ No	
t. Parent left comments about activity	____ Yes	____ No	

2.	Student engaged in BAIP Parent Activity	Observation		Comments
a.	Student helped parent access BAIP site on laptop/pc	____ Yes	____ No	
b.	Student helped to create parent account	____ Yes	____ No	
c.	Student helped to add student info to parent account	____ Yes	____ No	
d.	Student helped parent in navigating through the BAIP site	____ Yes	____ No	
e.	Student interacted positively with parent	____ Yes	____ No	
f.	Student was distracted during the activity.	____ Yes	____ No	
g.	Student appeared to enjoy the activity	____ Yes	____ No	
h.	Student was engaged while completing the components	____ Yes	____ No	
	Introduction	____ Yes	____ No	
	Structured activities	____ Yes	____ No	
	Teachable moments	____ Yes	____ No	
	Vocabulary	____ Yes	____ No	
	Dictionary	____ Yes	____ No	
	Tip sheets	____ Yes	____ No	
i.	Student fidgeted a lot during the parent activity	____ Yes	____ No	
j.	Student acted out during the activity.	____ Yes	____ No	

Activity Start time: _____ Activity End time: _____

	Activity Component	Start time	End time	Comments

Total Time: _____ hours _____ minutes

Appendix XII: Parent-Child School Sessions Demonstrating Competence And Empowerment

Case 1: Julia and Jason

Prior to engaging in the BAIP parent activity, Julia felt the most uncomfortable with teaching and explained that her, "verbal skills to get somebody to understand something [was] not very strong." Julia said that even if she understood something, "getting somebody else to understand what I'm looking at or how I'm seeing things. I'm not, not strong there at all." Like her son Jason, Julia often found herself in the position where she knew "the answer to some math problems [but didn't] know how [she got] there." That made teaching difficult as she believed that math needed to be "figured out in steps." Julia noted that her self-reported comfort level was "not a one just because [she did] know some math " but when push comes to shove she said, "if I had to do it myself, I could do it." Her discomfort was apparent at the start of the observation and lessened as the activities progressed smoothly.

During the observation, Julia and Jason went through the parent activity script on the computer together. It took 9.5 minutes to complete the lesson and it was the shortest time devoted by any parent participant in completing the structured activities. There were at least seven missed opportunities for eye contact and no actual eye contact observed. She read the instructions aloud, anticipating that Jason's difficulty with reading would impede his math performance. Prompts and definition reminders were provided at various times. When Jason said he "forgot what greatest common… greatest…," Julia jumped in immediately with the definition, "greatest factors of 12. " Julia watched on as Jason worked out the greatest common factors of 16, he thought aloud, "So it'll be 1, and it'll be 16 on those. So it'll be 1. 2 would go in there." Jason paused and stared at his work sheet for about four seconds before Julia jumped in with a prompt,

"Would 4?" Jason said he didn't know and then did some mental calculations before counting out multiples of twos, "2, 4, 6, 8, 12. 6 would go in there." Julia made encouraging sounds to let Jason know he was on track. He went on to list 3 and 4 as factors. Julia said to Jason, "I think you need to relook at your list for 16. What do you have?" Jason looks at the instructions and script which is not scrolled down to the solution, then cancels out his first attempt to try again. When he couldn't figure out what he was missing, he confessed to Julia that he wasn't sure. She then prompted him with the number 4, waited a while to let him think about it and then explained that "4 times 4 is 16." Julia followed the prompts on the lesson and guided Jason through the activities without hiccups.

Julia's post-observation self-rating increased from 2 to 4 on comfort level and she proclaimed that the experience was very good as, "there was definitely more guidance than anything that we've ever gotten to do together." The BAIP parent activity "was much better" than any other math experiences they have had. She was initially worried that she "wouldn't understand what was being asked" and that they would sit there not knowing what to do. However, she "was a little bit relieved when [she] saw that there was a little bit of help after the problem" and was much more relieved when she "realized that [Jason] knew what he was doing." Julia's comfort level increased when she did not have to teach Jason something that he did not already have an understanding of. She mentioned worrying about looking up words and figuring out what the Structured Activities were about but then she realized that Jason's "prior exposure to the words recently" and the fact that he "already knew what they were asking" made it a little easier for her. She noted that Jason "probably helped a little bit more than he would on every assignment" because "he had already worked with his teacher and knew the assignment already and knew the common goal."

Julia said she would be comfortable helping Jason with his math "if this was always the standard that we use. If this was what was being taught at school and this is the resource at home." She felt that "it was informed and... and it didn't take a long time to figure out." Julia felt that the activity was easy as she had help from her son, Jason, "simply because he knew already what [they] were talking about" and Jason felt that the activity he was working on was "pretty easy." That made the parent-child school session more of a practice than an instructional experience. It was a pleasant enough experience that she would do more of such activities. If the school used BAIP as a regular resource and they had to engage in the parent activities "on a regular basis, we would be very much involved. And have a better understanding of what he was actually trying to do and see it."

Case 2: Angela and Amber

Of the 6 parents, Angela, at a self-rating of 3, had the second lowest among the parents on the pre-observation self-reported comfort level in teaching. During the pre-activity interview, Angela was neutral about being able to teach her student. Angela found teaching frustrating with her "not being able to get it out here. To tell them how to do it. To give them instructions how to do it." Specifically, Angela said the comfort level of 3 is because she "can't give them the how come sometimes" and she would get frustrated while teaching, "I don't understand why people don't get it so I get frustrated easily." The family made it a practice for the children to do their "homework at the dinner table while [Angela is] cooking dinner. They're at the table doing their homework. So that [she is] available to stop what [she's] doing [for them] to ask questions." However, Angela would prefer to have her husband, or older son help her, or hire a tutor, one who is an expert in the area, than to teach Amber herself. The person who provides Amber with the most support is Angela's husband. Angela said, "My husband has the rapport with Amber,

the two of them connect. Whereas, my son and I connect. So I will always help my son with his homework. When it comes to Amber, he has a way of getting her to do what needs to be done. So he does a lot of that with her." She described her husband as being "very patient and very... uh... good about it" and generally "better at that than [her] as far as teaching" and is "just very good with dealing with people." When her husband was not available, Angela turned to her older son, the family's "golden child" to help Amber. Angela expressed, "I could do it though if I really wanted to I could do. You know what I mean? But I've got my [spouse]. 'Here, you come help Amber. You do it.'" Angela's husband would say okay and then take over teaching Amber. As such, Angela was not very involved in Amber's homework but she could "help Amber understand the instruction" if she needed to.

Angela was very involved in educational discourse about women in math and science fields, jobs and the importance of math. Angela said that she would take Amber's goals into consideration and have talks about math as part of the preparation needed, "you'll need to know your math for that [job]. All the math. Not just the little math. You have to know everything." Emphasis was also placed on math that Amber was currently learning to reinforce the idea that it is important. "Your multiplication, your division, you'll always need those forever. And then it builds upon those." Angela used math daily for measuring at her job but professed to not remembering basic algebra at times because "if I haven't needed it, I haven't needed it." She also believed that parents should not do their children's homework as they need to figure it out for themselves. Angela said laughingly, "I don't wanna figure it out! I've already been there! It's just like the kids' homework. I've already done my homework! I've done it! You do your own homework." However, when pressed to figure something out, she could go through a refresher,

and the concepts would “come back. So [she would] have to maybe get the chapter of the book and go through it but then again... [She would] rather hire someone.”

Prior to the observation, Angela predicted that Amber would take the lead during the session because “she's so much smarter,” and that was exactly what happened. From the very beginning, Angela asked Amber how to navigate the online parent activity and she took over the controls. After reading the instructions, they each picked writing instruments off the table and Angela had some trouble getting a mechanical pencil to work. Amber noticed and jumped right in to explain how to use it and then demonstrated how to work another one. Angela worked through the lesson with Amber in a way that no other parent-child pair did. Angela and Amber both attempted the questions on their own blank sheets of paper and then compared answers as opposed to other pairs where only the child did the work. Angela set a good model for working on math that she found challenging.

> Daughter: What you do is... what, okay well so, five and three, there's a common denominator...
>
> Mother: The common denominator is 15, I got that.
>
> Daughter: Okay. Um and so you do... how many times does 5 go into 15? Three times.
>
> Mother: Three times
>
> Daughter: So 2 times 3 equals 6 so you do six 15s. [Looks at Angela] And then 3 times 5 equals 15 times. So, it's 5 times one five. (5 x 1/5) [Looks at Angela]
>
> Mother: Okay, five 6s, five 15s. Okay. Alright, so what's, so you subtract that. The larger from the smaller and you end up with one fifteenth. [Looks at Amber]
>
> Daughter: Uh-huh [Amber nods as she writes. Angela turns to write. Amber turns to look at her mother writing.]

Mother: Very good.

Daughter: See... [Still looking at Angela. Left raised eye brow. Soft tone of voice] It feels like I'm teaching you.

The pair was working on subtracting $^{1}/_{3}$ from $^{2}/_{5}$ and Angela asked Amber how she did it. Amber was writing and about to respond when Angela ventured an answer, "Cross-multiply?" Amber said no and Angela leaned over to look at her work. Amber showed her mother how she worked out the problem by first finding the common denominator, the numerators, and then subtracting them. Amber coyly shared she felt like she was teaching her mother which made Angela laugh. Angela leaned over to press her forehead against Amber's cheek and said with a laugh, "I told Sharon I wasn't very, well, that you would teach me. So you did exactly what I said you would."

In another instance, Angela said to Amber, "tell me how did you did that 'cause I don't understand. 'Cause I got six eighths. How's my answer different? 'Cause I multiplied?" Amber explained to Angela that she had to "multiply on both sides" and instead of cross multiplying, she should go across. They worked out an answer and Angela said to Amber, "you know what? You're right. You multiply just across. How I got six eighths. Alright, so you're right. You're right. mommy's wrong." Amber also tested her mother's mental math with questions like "what is 8 times 6? Angela rose to the challenge and responded with the correct answer upon which Amber smiled, broke eye contact to turn back to her paper, sucked in her lower lip and then said, "Mmm hmm. I'm teaching you." Angela rebutted with "No, I taught you that one." When they got confused about what to do, they dialogued about the question, the concept at hand, and how to solve for the answer. At the end of the session, Amber teased her mother, saying, "I probably did all the work." Angela laughed and said they made a good team. Overall, the parent-child

activity went well and both participants appeared to have used the session as bonding time. Angela said it was “very comfortable, very relaxed” and she had a lot of fun with Amber. Eye contact was made 13 times in 15 minutes and physical contact such as hugs and pecks on the cheek were observed. Only 2 missed opportunities for eye contact were observed as mother and child appeared very much in sync with one another.

After a successful parent-child activity with the Parent activity, Angela’s self-reported comfort level increased from 3 to 5. Amber provided a lot of help and demonstrated understanding of the activity directions and was effective in working the problems so Angela felt a great sense of pride in her daughter. Angela said, “I’m very proud that she's learned it, and learned it so well that she can even teach her mommy.” Angela appreciated the demonstration of understanding and the refresher that the Parent activity provided, which made it simpler for her. She said, “it brought great joy to me to have my daughter understand, and her be able to show me and for me to say, ‘oh yeah, you're right.’” Angela felt that this was “was so easy that [she could] see [herself] doing it 'cause there's no way for [her] to get frustrated with it.’ ‘Cause Amber already knows it, basically. And it's just giving her a little more [guidance].” Most importantly, Angela noted, “I'm not teaching her, I’m guiding her through something that she already knows.”

Case 3: Colin and Craig

Before engaging in the BAIP Parent activities Craig’s father, Colin, reported his comfort level in teaching at a 3.5. Colin had six years of teaching experience at a community college and leaned towards being comfortable teaching, saying “as long as [he] understand[s] it, [he’s] real comfortable with it.” Colin’s main concern was that teaching methods during his time as a student had been different and has changed, “some of the difference I have is, some of the things

that they call it now is different than what I call it. So I might know what it is but it's called something different." Colin was also concerned that teaching conflicts would confuse his child. Colin recalled that when working on homework with Craig, his son would "just want you to give him the answers" and "that's not really helping him." Prior to the observation, Colin "was a little nervous about what was going to happen" because he was not sure if he was "gonna be able to convey the thoughts to him." Craig did not help matters when he kept saying "I don't know any of this" and acted like he did not want to go over the Teachable Moments prior to the observation.

During the observation, Craig was rather quiet throughout the engagement of the Structured Activities and let his father, Colin, lead him to the solution with continuous prompts. Craig would respond to direct questions with short phrases or monosyllabic answers while showing signs of being under stress. The father and son made eye contact only three times in the 14 minutes that they took for their activity. The structured format did not seem to be comfortable for Craig and Colin worked hard to keep his son engaged with prompts and words of encouragement. When Craig appeared confused by a calculation of multiples of 3, Colin asked in a gentle tone, "Need your calculator? Need to write it down?" Craig slipped into silence, hunched over the table slightly with his hand covering his forehead, and played with his hair along the hairline. Colin provided more prompts to get Craig to continue with the problem and then nodded and when Craig got the answer, said encouragingly, "Right. There you go." Colin recalled that "trying to wait for Craig to get the answers down" and trying to figure out "whether or not Craig's understanding it or not" were the parts of the activity that he liked the least.

Colin said that working on the Teachable Moments section the day before boosted his confidence for the Structured Activities. He thought "it helped [Craig] yesterday when [they] just talked about it and he went right through it. So I felt better about it after we did the Teachable

Moments first." The Teachable Moments was better for Colin as he felt "it was just more laid back. I mean in, Craig seems to be more at ease." Like Colin, Mrs. Joyce observed that Craig is a lot more comfortable with learning math that is informal or that has real-world contexts. She said that "he'll get the language where some of the other kids don't get it." For instance, "when we do math where we are talking about probability, we're talking about things that don't seem so mathematical. It seemed more common sense, he soars."

For Colin, going over the lesson the day before helped him prepare for working with Craig on the Structured Activities and for getting comfortable with the scripted dialog in the lesson. Colin's comfort level increased from 3.5 to 4.5 as he thought the lesson "was well structured" and he thought it "seal[ed] the point home more." The lesson provided a lot more structure than Craig's math textbook. Colin did not appreciate the textbook as it "just doesn't give you a clear understanding of what... when it tells you to do something, it doesn't tell you why you're doing it. It just tells you to do it. It gives you one example and then expects you to go on and do the rest of it." He said he would do more of such lessons but "mix them up a little bit" such as "teachable moment this day and regular structured activities the next day or something."

Case 4: Marissa and Miles

Marissa was the most comfortable parent at teaching, partly because she had experience in home schooling her children for at least a full year, and was also good at math herself. Marissa reported her comfort level a 5 out of 5 before and after using the BAIP parent activity. Her experience preparing herself for homeschooling gave her a lot of confidence in teaching. During the 18 minute observation, Marissa and Miles made eye contact eight times and missed three as they zipped through the activities. Several times, Marissa would chance upon a teachable moment and expand upon the concept with her own knowledge but would realize that Miles

already knew the concept. She said the experience was “pretty much classic Miles. Teach it to me. I already know it. Stop now.” During the parent–child activity, she found it challenging to keep her son engaged. Her “brain [was] spinning quickly to figure out ways to keep up with Miles and keep him engaged.” Thoughts that raced through her mind were like, “how can I make this more interesting? I'm losing him, I'm losing him. How can I, what else can I say, so that I don't, so that he's not completely gone.” She said that “doing activities like this, especially when I know... I'm going to lose him quick, tends to be a little bit more stressful for me.” Such situations were similar to prior home schooling experiences but she had more time to prepare a curriculum with lots of games and activities to keep Miles entertained. She did not add to the BAIP lesson as she was not sure that she could do so. Marissa did find the Teachable Moments fun and creative, simple and quick to implement with “stuff that’s just lying around the house.” This was a concept that she was very familiar with as the family incorporates a lot of informal learning in their everyday routine.

Marissa thought that other parents who are less comfortable with math, or with children, who had more struggles, would possibly appreciate the resource more. For her and Miles, a shorter, more efficient lesson would be better suited for her son. She commented that “most parents actually sort of freak out with math. Unless your mom’s a doctor or your dad's an engineer, I think most kids find that when they turn to their parents, their parents don't know how to help them with math.” Marissa painted a somewhat gloomy picture of the real-world where “both parents are working. And you know by the time they get home and they've gotten dinner on the table and... or they've shuttled this kid off to ballet and this kid to soccer. They've taken care of the dog. Like, helping the children with homework becomes less of an enjoyable event and more of a stressful, how the heck are we going to get this done, and get this kid to bed on

time, sort of situation." However, she noted that if she "had access to this kind of stuff, and it was already designed for me, where I could just pull it up and say, 'oh, this benchmark, this game will help me.' [She'd] be pulling this kinda stuff up all the time." She would have a starting point to add to instead of having to create a curriculum from scratch.

Case 5: Tanya and Trent

Tanya, Trent's mother, reported comfort level as 4 before and after the parent activity. She said she was "pretty comfortable" with teaching math "through algebra." However, if the topic was about finding proofs, Tanya would not be comfortable teaching at all. She confessed that "somebody would have to teach [her] before she] could teach" Trent. Tanya would ask her husband to teach her before she could teach Trent. When Trent has to work on Geometry, she would get her older son to help "'cause he loved geometry and hated algebra, which is the opposite of [her]." In general, Trent "is pretty independent with his homework" but she would be the one providing assistance if he needed help.

Like Marissa, Tanya was adept at creating resources for Trent when he needed help. She used to make him redo every question that he got wrong on his homework, or "make up totally new problems" for him to work on. Tanya felt similarly challenged when it came to keeping Trent continuously engaged. During the 41 minute activity, the longest session of all the duos, Tanya and Trent made eye contact 40 times and missed eye contact 13 times when one or the other wasn't looking. Physical contact was observed five times when Tanya tapped or gently nudged Trent to get his attention. The only other parents who made physical contact with their children were Angela and Gordon. Gordon's tap on Gwen's arm was also an attempt at cajoling her to keep on working. Angela's was a peck on Amber's cheek when her daughter paid her a compliment. Tanya also pled with or chided Trent 14 times to cooperate with her on the

activities. Tanya was thorough in checking her son's understanding of the concepts. Many times she would add follow-up questions. She explained, "I knew he knew but I wanted to make sure that he could verbalize it. 'Cause if he can verbalize it, then he really does know it and will know it in the future as well." The lesson was long and Trent found it difficult to keep going with the same level of concentration. At one point Tanya said to him, "Trent, I need you to sit up and pay attention." Although Trent was not visibly happy with it, he always obliged his mother for a few more minutes. In turn, she tried to find examples in the activity that would interest him, especially math data relating to sports.

After the observation, Tanya said she was surprised that Trent was not unnaturally well behaved. He was "exactly like he is at home," always asking "How many more pages?" She found the BAIP parent activity to be informative and filled with real-world examples and felt that the suggestions "would be helpful for many people" but she believed that she "could have thought of that on [her] own." Even though Tanya was already comfortable teaching Trent math, she was aware that there would be some topics that would be challenging. Her comfort level would not then be at a 4 and would be lower, for instance "when we get into geometry but... we're not there so..." The experience with the scripted dialog and real-world examples in the BAIP lesson gave her a sense of empowerment and she commented that if Trent ever needed help with something that she had trouble with, she would be comforted with the knowledge that the BAIP resource was available without having to research it intensively. Tanya said, "If I had to go Google and find out? Maybe I'd find some resources maybe not but it would be helpful to know exactly where I could go."

The experience with the BAIP parent activity empowered her and she felt that she would play a bigger role, just not "in a way where the school should do less."

> You know, I mean that in... you know, if we were 80-20 [percentage stakeholders in the responsibility partnership] before, they're still 80 but I might be 30. So we've gone above that threshold. Does that make sense? Okay. So I don't want them to do any less but I can see the benefit in doing more as a parent. (Tanya)

Case 6: Gordon and Gwen

Gordon was comfortable teaching math to his daughter Gwen "for the most part" and reported himself a 4 out of 5. However, he qualified it with, "If she's like she's right now, it wouldn't be too bad. If she's like she was two years ago? Oh... I'd hand her over to the tutor any day. 'Cause we just didn't get nowhere." When Gwen was acting out and disliking school, he noted that "[they] just didn't clique too much when she was like that", and they got in to lots of arguments. Like Julia, Gordon could not understand why his child could not understand math. That led to frustration and they "butted heads a lot." Gwen would shut down a lot because Gordon attempted "to shove [the information] down her throat and she didn't like that." Gordon struggled in school himself and did not have the most positive schooling experience. His own father used to help him in mathematics and was even stricter than Gordon was with Gwen. He recalled, "sitting with Dad with the flash cards and he was worse than I was. I remember I got grounded for a week because I didn't remember my 3s." They finally hired a tutor for Gwen "because uh we're decent parents but we suck as teachers when they're like that. So we gave up and got a tutor." Gordon observed that he has since found it a lot easier to provide homework assistance with behavioral problems out of the way and Gwen enjoying learning again at the private school.

The activities provide opportunities for parent-child two-way interaction, though not in an expected manner. Gwen purposely made errors to see if her dad would catch them. She was

writing math facts when she stopped writing, turned slowly to look at Gordon then said, "I accidentally put a times in there instead of divide." Gordon looked at Gwen then acknowledged the error. Gwen chided him, shook her head slightly as she wrote, saying, "You're supposed to catch it, daddy." Towards the end of the session, Gordon looked at Gwen's work and pointed at an error then said, "Ah, wait a minute, 30 times 6 is not 5." To which, Gwen defiantly shook her head, pointed at a previous example where she had written 10 x 5 = 2, and 10 x 2 = 5 instead of the division symbol. She made Gordon laugh when she pointed at an earlier question and retorted, "You didn't catch me up here." Gordon then asked her to rewrite the math facts and noted that she should redo them since she hadn't told him about the incorrect symbol. Gwen was not happy at being accused of hiding the error and said she would have told him later.

During another activity where Gwen had to draw two cards from a deck and multiply them, Gordon insisted that certain numbers not be used as they were too simple for her. Thus Gwen had to drop the 1 card as well as the 10 card if she already had one 10. At one point, Gwen pretended that two cards she drew were 10s and she said in mock disappointment, "Oh man… Darn it!" Later on, she drew two more cards and placed them face down before Gordon could see the numbers. She started to say the math fact, 2 × 10, but was interrupted by Gordon who turned the cards over. The second card was not a 10 and both laughed at the fact. Gwen said gleefully, "I gotcha!" Gwen attempted to trick her father one more time without being caught before Gordon decided to change the activity. Gwen also had fun with word play; she was instructed to "write down two numbers and show [Gordon] that [she knew] how to do it." Gwen let out a sign and then wrote down two numbers on a blank sheet of paper. Gordon laughed out loud, stopped to pick up the sheet to show me. He said, "You can't see what she wrote, did you?" Both laughed as they surveyed the 10 × 10 that Gwen had written. Gwen had her head tilted to the

right and finger on her lips as she looked at Gordon cheekily, then smugly said, “Hmmm. You said write down two numbers.” Gordon ignored the statement and offered two new numbers for her to work on. Then ensued a parent-child negotiation of what numbers had been done, whether it was done the day before, and the fact that they had not done it that day.

The parent-child activity lasted 37 minutes, the second longest session of the 6. Gordon went through all the structured activities and had Gwen write out every step on blank paper. Gwen’s attention span was short and was easily distracted so Gordon had to cajole her into paying attention and raised topics like money, as that interested her. He chided her when she stared out the window, read aloud the words that were stuck on the wall or blackboard, or contorted her face in a show of boredom. Gwen was observed showing signs of boredom ten times in the 37 minutes. She dramatically dropped her arm heavily on the table to write, raised her pen in the air and watched her hand slowly lower it to the table with a thump, contorted her face by stretching her mouth sideways as wide as she could with her eyes wide open, sighed, marched on the spot while seated and even shrieked once. Towards the end of the activity, Gwen was so bored that she dropped her head forward and her upper torso slowly slumped over till her forehead hit the table with a resounding thump. Gordon would tell her that she was losing her concentration and she would agree with him before trying to pay attention again. He told her, “When you're looking at something else, you're not concentrating on what you're doing. You're not going to learn anything.” Other times, he laughed and told her, “Uh huh, you're being silly.”

Gordon was the only parent who made his child take breaks during the session although Trent did take one break to go in search of a different chair. Gwen would walk out into the corridor to look for her favorite teacher and return when she was ready. Each break was not longer than a few minutes. It is important to note that the duo had some practice the day before

with the lesson where they worked out both Teachable Moments and Structured Activities. She said “we did that yesterday” when Gordon proposed doing a sum with the numbers 4 and 7. This repetition may have affected Gwen’s engagement level even though the numbers they used in the sums were different. In addition, she had been in the room before but never looked at the words on the walls in detail. Gwen said she felt distracted during the session because there were “so many things to look at.”

After the activity, Gordon noted that the session was typical of what happened at home except that there would be family members walking by the dinner table as they worked on homework. Gordon felt that the lesson was pretty good and “helps with the memorization” of math facts. The structure of the lesson they worked on made sense to him and he thought it was a good way to teach math facts backwards and forwards (i.e. $4 \times 5 = 20$, $5 \times 4 = 20$, $20 \div 5 = 4$, and $20 \div 4 = 5$) because “they're getting more than just the one fact at a time.” He felt that the lesson was similar to how he would have helped Gwen at home and his comfort level in teaching remained a 4 out of 5.